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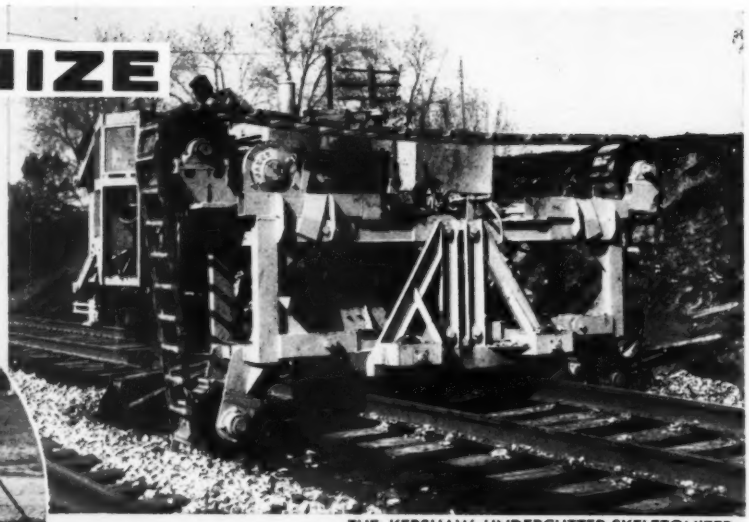
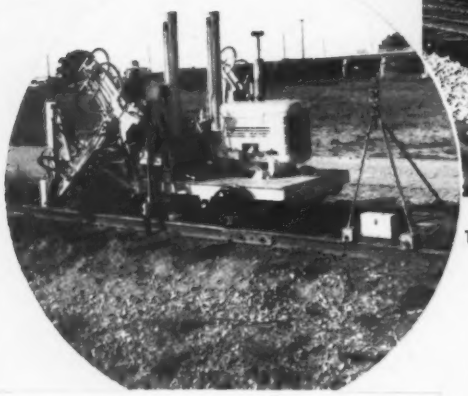


THE KERSHAW UNDERCUTTER-SKELETONIZER



THE KERSHAW JACK-ALL

THE KERSHAW TWO-WHEEL KRIBBER

THE KERSHAW TIE BED CLEANER

THE KERSHAW BALLAST CLEANER

Is skeletonizing track on your work schedule this year, either for reballasting, retimbering, ballast cleaning or undercutting track? If so, Kershaw machines can help you do the job much quicker and at substantially less cost.

Here's TWO Ways the Kershaw Machines Do the Job:

1. The Kershaw Jack-All raises the track 2 inches.
2. Kershaw Two-Wheel Kribber removes ballast between ties.
3. Kershaw Track Undercutter-Skeletonizer follows and removes ballast from under ties as much as 6 inches.
4. If ballast cleaning is desired, the Kershaw Ballast Cleaner picks up the removed ballast from the track, cleans it and returns it to the track.

1. Kershaw Two-Wheel Kribber removes ballast from between the ties.
2. Kershaw Tie Bed Cleaner (with squared feet) removes ballast from under the rail.
3. If ballast cleaning is desired, the Kershaw Ballast Cleaner picks up the removed ballast from the track, cleans it and returns it to the track.

Try them on your railroad! Write or call today!

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How to put more life in your track

Here's a sound and practical plan
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Rail life increased 2½ to 4½ times on N & W

*As an example of the economies obtainable from heat-treated track, just listen to this excerpt from Railway Track and Structures:**

"The Clinchfield has been greatly interested in the performance of heat-treated rails installed on the Norfolk & Western . . . From this test installation, the AREA Rail committee concluded that rail life had been increased 2½ times (on the high-side rail) and 4½ times on the low sides of curves.

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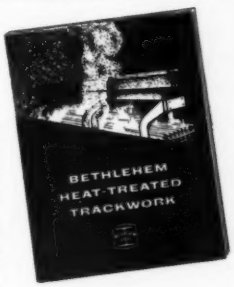
Your road, too, can reap substantial savings with heat-treated rails and trackwork. Bethlehem, a pioneer in the field, offers you a practical and well illustrated catalog on heat-treated trackwork. Just fill out and send in the coupon below.

**March, 1958, p. 55*

Send Now for Informative Catalog



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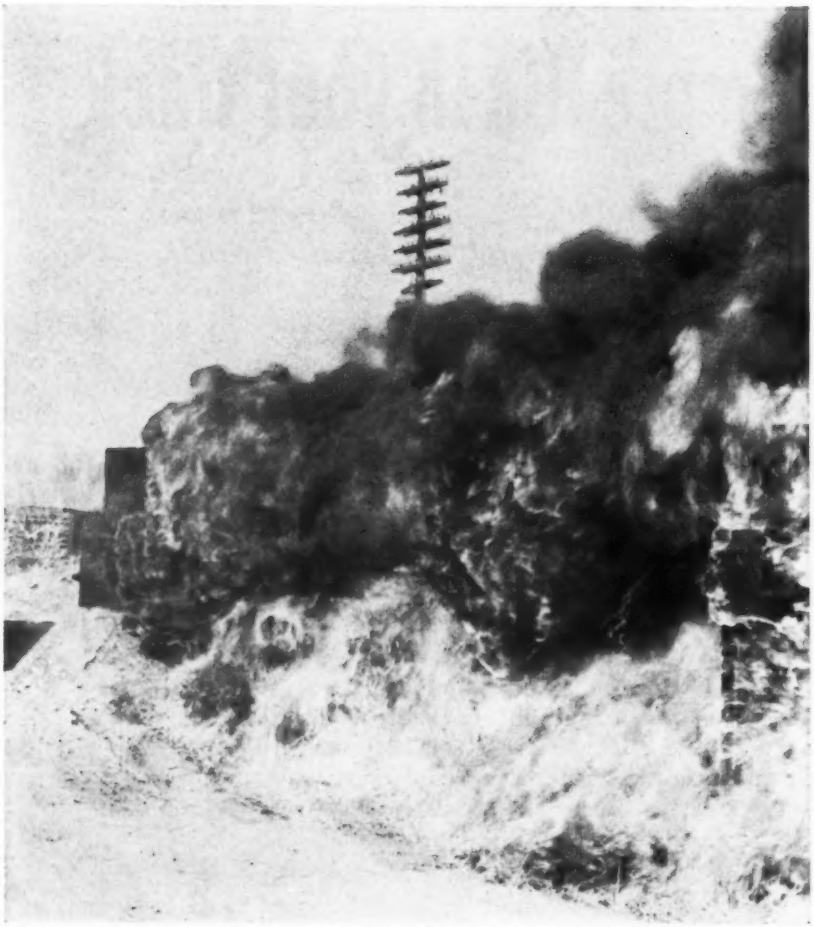
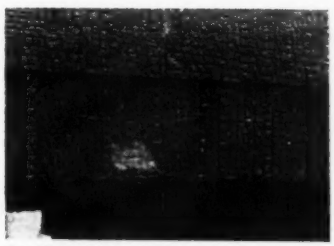


Bridge replica is enveloped in flames and smoke, but fire is out 18 min. after tumbleweeds are ignited. Shown here is peak of fire 45 sec. after it started.

ALL SET for test—tumbleweeds are placed under bridge and around bent, ready to fire.

AFTER FIRE—tumbleweeds are consumed but bridge replica stands essentially undamaged after 1600°F. ordeal.



SCRAPED AREA after fire shows maximum char depth of ¼ inch. Note that incising marks are still clearly visible.

New Dow chemical safeguards timber trestle from raging fire!

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Research development of Arban, followed by 3 years of field tests in cooperation with a leading western railroad, revolutionizes accepted concepts of timber trestle economics.

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TRACK and STRUCTURES

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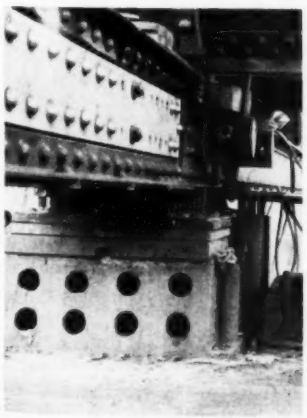

in this issue:

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How to install girders with one crane 23

Use of special erection trusses enables CNR to place members up to 110 ft in length with a single locomotive crane.

Puts spot surfacing on production basis 26

By using small gangs consisting of three machines and 15 men this road expects to maintain its tracks in better riding condition.

Welded bridge has 101-ft girders 28

First such structure to be built in California has special features of design to reduce fatigue effect on welded connections.

Renews track with preassembled panels 30

New York City Rapid Transit Authority uses mass-production methods in constructing panels for installation on elevated line.

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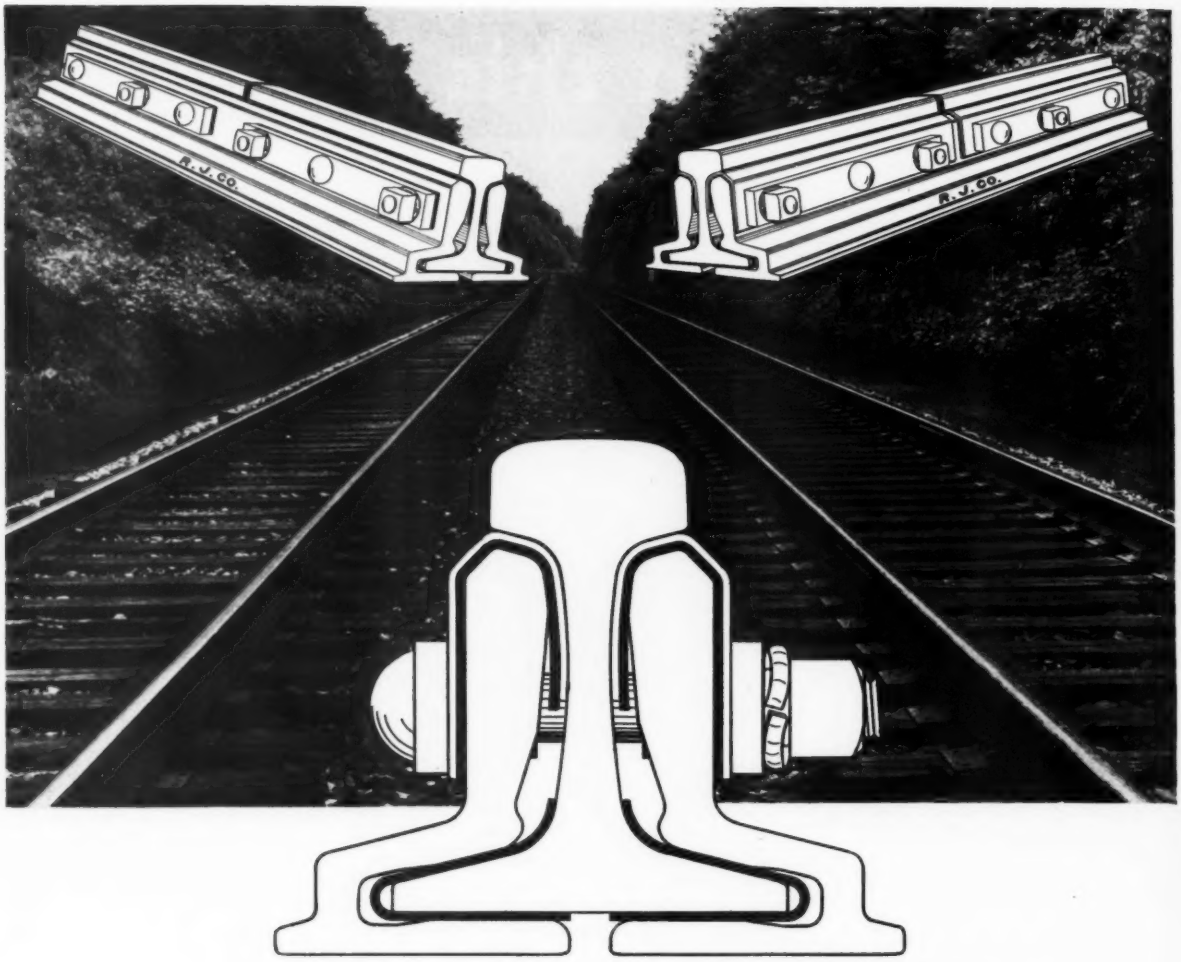
DON'T MISS . . .

Problem: Roller nests at expansion ends of 160-ft trusses had filled with dirt and had worn flat. This set up secondary stresses in trusses.

Solution: Illinois Central uses slide plates of special design to replace rollers. They do not clog with dirt nor require a bridge raise.

. . . in the August issue



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RAILWAY
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Dear reader:

No time for supervisors to relax

This is a year when supervisors in the maintenance-of-way department are, on the surface anyway, having a rather easy time of it. For the most part they don't have their usual programs of heavy work to worry about. Consequently many of them are not confronted, as they would be in a normal year, with the heavy responsibilities attendant on supervising a succession of extra gangs.

Does this mean they can relax and take things easy? Obviously not. The question is purely academic. Their responsibilities may not be quite the same as during normal years. But they are just as exacting, possibly even more so. With available forces spread more thinly than usual the supervisor must be certain that his men are spending their time to best advantage and on jobs with top priority.

Special problems are created by the deferment of heavy programs. For example, spot surfacing and lining operations may be required on territories previously scheduled to be surfaced out of face. Where heavy tie renewals were included in the deferred program it may be necessary to make a careful check of the territory for the purpose of renewing broken or other failed ties. The latter statement applies in any case where cut-backs have been made in new tie allotments.

Some properties are in better shape than others. There are lines where there was a considerable accumulation of deferred work coming into 1958, and where this year's programmed work has also been deferred. More than the usual amount of care and planning will be required to take care of critical locations in such territories. In such situations the supervisor will find it necessary to be especially alert to the needs of the property. And he may find it necessary to exercise more than the usual amount of ingenuity in using the men, materials and equipment made available to him.

What has been said here about track work applies also with equal force where bridge repairs have been deferred. If a structure has been scheduled to receive heavy repairs it may be necessary to inspect it carefully to determine if any "spot" work is necessary to tide it over until the deferred work can be done.

In spite of the special problems that will arise for supervisors during periods of retrenchment the likelihood is that the demands on their time will not be as pressing as in years of greater activity. How, then, can they best use the extra time available to them?

In discussing this question an engineer maintenance of way made a suggestion which seems to have considerable merit. He would have his supervisors use the extra time to do more future planning. They must be prepared, he said, for the time when normal allotments will again be available. At that time they should be ready with detailed recommendations for work to be done on their respective territories. What's more, he added, they should be thinking ahead two or three years, not just months.

During recessive periods the supervisor must, in short, exercise adaptability in adjusting his thinking to the difficulties of the present, while, at the same time, giving some thought to the problems of the future. MHD

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New Essolube HD offers outstanding detergency properties —plus improved oxidation stability and bearing corrosion resistance—for both gasoline and diesel maintenance-of-way equipment. This was proved in extensive laboratory and field tests prior to its introduction. Under *low*-temperature conditions, Essolube HD markedly reduced sludge deposits. And under *high*-temperature conditions, it reduced piston varnish and top ring deposits to a new low. ¶ Such outstanding all-temperature detergency keeps engines cleaner longer...increases power, reduces wear, lengthens time between overhauls and extends engine life. ¶ Because versatile Essolube HD...is ideally suited for almost all maintenance-of-way gasoline and diesel engines, savings can be shown on inventory and handling. ¶ For the full story on new Essolube HD, call your local Esso office or write:

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News about people

BALTIMORE & OHIO—Charles R. Riley, chief engineer, maintenance, has been appointed chief engineer with headquarters as before at Baltimore. Coincident with Mr. Riley's appointment, the engineering and maintenance-of-way departments of the B&O were consolidated. **Karl J. Wagoner,** chief engineer in charge of the engineering department, has retired. **E. F. Wright,** assistant chief engineer of the engineering department, has been appointed assistant chief engineer — construction, and **C. E. Jackman,** assistant chief engineer maintenance of the maintenance-of-way department, has been named assistant chief engineer—maintenance, both with headquarters as before at Baltimore.

CANADIAN NATIONAL—J. J. Pomor, assistant division engineer at Port Arthur, Ont., has been promoted to division engineer at The Pas, Man., succeeding **W. T. VanDeventer,** who has been named terminal construction engineer at Winnipeg, Man. **R. L. Gray,** division engineer at London, Ont., has been promoted to district engineer at North Bay, Ont. **R. C. Weller,** division engineer at Hornepayne, Ont., has been transferred to London, succeeding Mr. Gray. **G. A. Van deWater,** assistant division engineer at Hamilton, Ont., has been named engineer at Hornepayne.

ILLINOIS CENTRAL—John M. Trissal, chief engineer at Chicago, has been elected also vice-president. In the latter position he succeeds **Charles H. Mottier,** whose retirement as vice-president in charge of engineering was announced in the May issue.

C. H. Prater, supervisor of track with headquarters at Centralia, Ill., has been transferred to Chicago, succeeding **W. H. Naas,** who has retired after 44 years of service. **R. E. Cozadd,** general foreman of track with headquarters at Carbondale, Ill., has been promoted to supervisor of track at Centralia, to succeed Mr. Prater.

MISSOURI-ILLINOIS—I. P. Rutherford has been appointed roadmaster, with headquarters at Sparta, Ill., succeeding **R. E. Vermillion,** who has retired.

MISSOURI PACIFIC—Frank B. Persels, assistant engineer of roadway standards, has been promoted to office engineer, succeeding **Arthur W. Eggers,** who has retired after 49 years of service with this road. **Ray V. Hazer** has been promoted to valuation engineer, succeeding **Harold T. Bradley,** who has retired after 39 years of service with the Missouri Pacific. Both Mr. Persels and Mr. Hazer have offices at St. Louis.

SEABOARD AIR LINE—J. E. Spangler, office engineer in the chief engineer's office at Norfolk, Va., has been promoted to principal assistant engineer, with the same headquarters. He succeeds **J. L. McBride,** who has been promoted to division engineer of the North Florida division with headquarters at Jacksonville, Fla., succeeding **W. R. Fudge,** resigned.

A. C. Jones, Jr., assistant division engineer at Jacksonville, Fla., has been promoted to principal assistant division engineer at Savannah, Ga., to succeed **H. E. Richardson,** who has been transferred to Americus, Ga. **J. C. Britt,** assistant to the division engineer at Savannah, has been named assistant division engineer at Jacksonville, to succeed Mr. Jones. **Howard Watts, Jr.,** a bridge designer in the road's headquarters office at Norfolk, Va., has been appointed assistant division engineer at Jacksonville.

SOUTHERN—Walter J. Snellings, assistant accounting engineer in the office of the chief engineer, has been promoted to accounting engineer to succeed **W. Hugh Hayworth,** who has retired after more than 43 years of service. Mr. Snellings will have headquarters as before at Washington, D. C. He is a native of Virginia and entered the service of the Southern at Washington as a clerk in May 1920. After serving in various clerical positions he was promoted to accountant in the office of the chief engineer. On September 1, 1945, he was appointed engineer accountant and on June 1, 1950, he became assistant accounting engineer.

J. Thurman Roberts, assistant division engineer of the Knoxville division, at Bristol, Va., has been promoted to division engineer at Sheffield, Ala. **Robert B. Rust, Jr.,** bridge and building supervisor at Lexington, Ky., has been promoted to assistant division engineer at Bristol, succeeding Mr. Roberts.

Frederick G. Keller, Jr., has been appointed track supervisor at Orangeburg, S. C., succeeding **Willard L. Meigs,** who has been transferred to Alexandria, Va. **Alvin E. Chambers,** track supervisor at Manassas, Va., has been transferred to Salisbury, N. C.

Albert B. Watkins has been appointed bridge and building supervisor at Charleston, S. C.

Obituary

T. H. McKibben, 73, retired assistant chief engineer, Santa Fe, died on June 2 at his home in Chicago.

Charles R. Riley
B&O

John M. Trissal
IC

J. E. Spangler
SAL

Walter J. Snellings
Southern

Biographical briefs

John M. Trissal, 54, who has been elected vice-president and chief engineer of the Illinois Central at Chicago (announced elsewhere on this page), graduated from the University of Illinois in 1925 with a bachelor of science degree in electrical engineering. He entered railroad service on September 16, 1925, as a draftsman with the IC. In June 1927 he was advanced to junior engineer, and in August of the following year he was made assistant engineer. Two years later, Mr. Trissal was advanced to assistant electrical engineer, fixed property, which position he held until October 1945 when he was promoted to superintendent of communication and electrical engineer. He was further advanced to assistant chief engineer in February 1950. On May 1, 1956, he was promoted to chief engineer, which position he retains in addition to that of vice-president of the company.

J. E. Spangler, who has been appointed principal assistant engineer on the Seaboard Air Line, at Norfolk, Va. (announced elsewhere on this page), was graduated in 1949 from the Georgia Institute of Technology with a Bachelor of Science Degree in civil engineering. He began his career with the Seaboard at Atlanta in 1949 and was stationed there until 1952 when he was transferred to the chief engineer's office at Norfolk. At the time of his promotion to principal assistant engineer, he was serving as office engineer in the chief engineer's office.

Charles R. Riley, 50, who has been promoted to chief engineer of the Baltimore & Ohio (announced elsewhere on this page), graduated from Baltimore Polytechnic Institute and obtained his bachelor's degree in civil engineering at Johns Hopkins University. He joined the Baltimore & Ohio immediately upon his graduation, becoming a draftsman in the signal department. After only two months in that department, he was moved to the main-

(*Continued on Page* 54)

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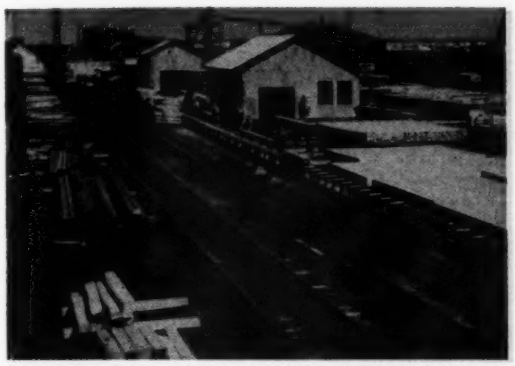

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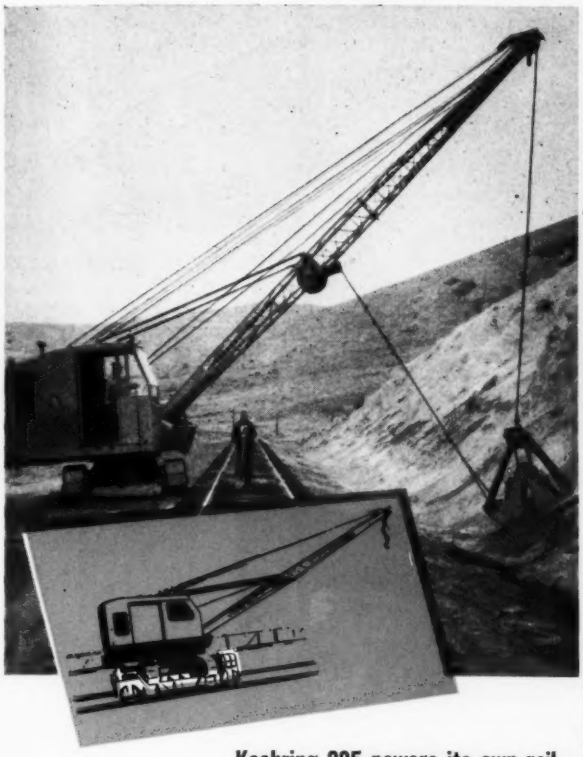

Koehring 205 powers its own rail car . . . loads, unloads itself in 10 min. . . . works on or off-track

Wherever there's excavating, lifting or material-handling to be done, Koehring® RailAid® takes to the rails — travels on-track from one work-section to the next at speeds up to 20 m.p.h. It's self-propelled — does 2 to 3 times the work of other excavators or cranes that have to crawl or be hauled from job to job.

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RAILWAY
TRACK and STRUCTURES

News notes...

. . . a résumé of current events throughout the railroad world

The railroads and their employees should work together to bring operating rules and working agreements up to date, states Guy L. Brown, grand chief engineer of the Brotherhood of Locomotive Engineers. "These things can be ironed out in honest, straightforward negotiations in which both sides negotiate on a genuine give-and-take basis," he said in a recent address, "taking into consideration what will be for the best interest of all employees and the industry as a whole . . ."

•

From Canada, however, comes a somewhat different point of view from management. CPR President N. R. Crump fears that "outmoded make-work rules" and "excessive wage demands" may hurt Canada's future development. Mr. Crump was critical of the influence which, he said, American labor leaders try to exercise over Canadian unions. "For Canada's national economic integrity to be placed in jeopardy at the whim and to serve the special interests of some union leader in the United States, does violence, I suggest, to the very spirit of Canadianism," he said.

•

Beginning July 1, coach rates for sleeper passengers went into effect on the Kansas City Southern. In addition to the coach fare they will pay only the Pullman charge for the space they occupy. To Pullman passengers the new rates mean reductions averaging 29 per cent. The reduced sleeper fares are experimental; unless extended, they will expire at the end of the year. President W. N. Deramus pointed to them as evidence of his line's faith in passenger business and of its desire to provide the best possible service at the least cost.

•

Class 1 railroads had a net income of approximately $16,000,000 in April, compared with $61,000,000 in the same month of 1957, according to the Association of American Railroads. In the first four months of 1958 net income approximated $48,000,000, a decrease of $176,000,000 compared with the corresponding period of last year.

•

Sub-normal earnings are being reflected in reduced employment on the railroads. According to the Interstate Commerce Commission, the Class 1 roads had 824,813 employees in May, a reduction of 17.80 per cent compared with May 1957. The May figure also represented a reduction of .48 per cent compared with April.

•

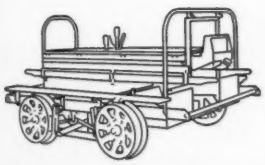
T. C. Carroll, 64, president of the Brotherhood of Maintenance of Way Employees, did not seek re-election at the Brotherhood's triennial convention held at Detroit during the week of June 16. It was explained he was retiring on his doctor's advice. H. C. Crotty, assistant to the president, was elected president. Mr. Carroll had been president since 1947.

What became of that steep grade? Ask

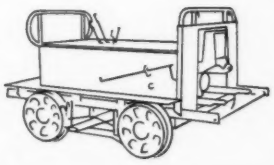
Fairmont

The grade is still there . . . it's as steep as ever . . . but the FAIRMONT M19 SERIES AA Motor Car levels it off as flat as the track on the left-hand page. A new two-cylinder, two-cycle engine developing up to 14 horsepower drives this car effortlessly up mountain grades—even against stiff winds with a full four-man load in the cab. Make it possible for your inspection crews to cover all locations . . . under severe conditions . . . and in normal time! Modernize and mechanize with Fairmont M19 Series AA Motor Cars!

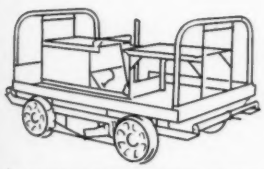
"Other Classes of Fairmont Motor Cars"



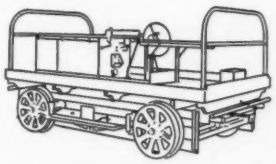
M14 SERIES H LIGHT SECTION CAR can carry six men, yet can be operated by only two. Features include a steel frame, demountable wheels and a 5- to 8-horsepower engine. Load capacity: 1,200 lbs.



S2 SERIES AA STANDARD SECTION CAR incorporates the new two-cylinder engine. Features one-way starting crank, 10- to 14-h.p. engine, light unit weight. Load capacity is 8 men or 1,800 lbs.



A5 SERIES C MEDIUM-DUTY GANG CAR can pull 6 trailers loaded with men and material. Features a 35-h.p. engine and special construction. Four-speed, two-way operation. Capacity: 8 men, 3,000 lbs.



A8 SERIES B HEAVY-DUTY GANG CAR features a 162-h.p. V-8 engine, four-speed transmission, four-wheel drive and a hydraulic turntable. Makes an excellent hump car. Capacity: 14 men, 4,000 lbs.

Fairmont Manufactures a Wide Range of Motor Car Sizes to Fill Practically Every Transportation Need.

FAIRMONT RAILWAY MOTORS, INCORPORATED
FAIRMONT, MINNESOTA

MANUFACTURERS OF BALLAST MAINTENANCE CARS, DERRICK CARS, OIL SPRAY CARS. GROUTING OUTFITS, TIE RENEWAL EQUIPMENT, RAIL RENEWAL EQUIPMENT, WEED CONTROL EQUIPMENT, HY-RAIL CARS, TRACK MOTOR CARS, PUSH CARS AND TRAILERS.

Helps from Manufacturers

The following compilation of literature—including pamphlets and data sheets—is offered free to railroad men by manufacturers to the railroad industry. To receive the desired information, write direct to the manufacturer.

HYDRAULIC CRANE. Two new pieces of literature, designated AD-2407 and AD-2422, describe the features of the Austin-Western Hydraulic Crane. These replace former Catalog AD-2253, which is now obsolete. AD-2407 is a two-color, six-page catalog showing the working ranges and capacities of the crane by photographs, diagrams and tables. AD-2422 is a two-page brochure showing the sizes and capacities of all attachments and special equipment. (Write: *Austin-Western, Construction Equipment Division, Dept. RTS, Aurora, Ill.)*

POLE-TYPE BUILDINGS. A moving-picture film has been made available which features large industrial pole-type buildings. It shows a huge industrial building under construction and many examples of industrial applications of pole-type construction. Called "Twice for the Money," this film is 16-mm, has color and sound, and runs 17 min. (Write: *The Dow Chemical Company, Dept. RTS, Midland, Mich.)*

CLAMPS, COUPLINGS AND JOINTS. An attractive file of two-color brochures is now available which covers the complete line of Marman clamps, couplings, straps, V-bands and channel-band couplings. The brochures provide detailed information on applications, sizes and dimensions of these products and are illustrated with photographs and dimensional diagrams. (Write: *Advertising Dept., Marman Division, Dept. RTS, Aeroquip Corporation, 11214 Exposition Blvd., Los Angeles 64, Calif.)*

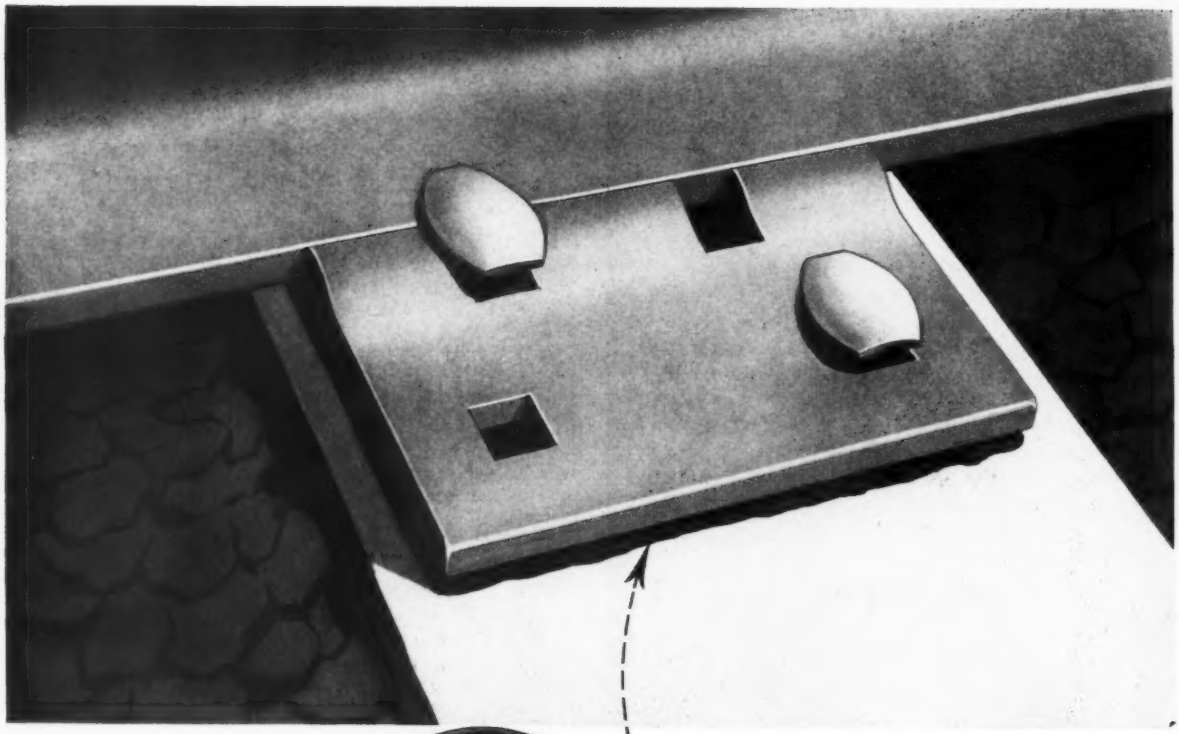
SELF-PROPELLED CRANE. A new two-color, four-page bulletin has been made available covering the materials-handling applications for the Bantam CR-35 crane. It includes 12 actual-job case histories which offer new ideas in application. (Write: *Schield Bantam Company, Dept. RTS, Waverly, Iowa.)*

SERVICE TRUCK BODIES. Called "Workshop on Wheels" is a new four-page, two-color brochure which describes the Mark C line of commercial service bodies for use on trucks. The folder shows the several bodies applicable to ½- to 1½-ton chassis, as well as the specifications for each. Some of the optional features available for these bodies also are listed. Also, three sizes of side boxes, matched to the Mark C bodies, are shown. (Write: *Holan Corporation of Georgia, Dept. RTS, Griffin, Ga.*)

GAS REGULATORS. Complete specifications and ordering information are included in a new 20-page two-color catalog on the Oxweld industrial gas regulators. A total of 47 regulators are described and illustrated. In addition to covering single and two-stage regulators for station and manifold service, the catalog describes a new line of CO_2 regulators and regulator manifolds for use in late-model pre-mix beverage dispensing machines. The recommended uses and installations are included in the description of each regulator. (Write: *Linde Company, Division of Union Carbide Corporation,Dept. RTS, 30 East 42nd St., New York 17, N. Y.*)

DIESEL CRAWLER TRACTOR. A 14-page catalog, designated MS-1289, is available which points up the features of the HD-16 diesel crawler tractor. The catalog directs attention to the advantages of big-tractor operation, the operating and control features, the choice of gear transmission drive and torque converter, and describes the sturdy construction of the heavy-duty main frame, the truck frames, tracks, and release mechanism. It also lists the specifications of this tractor and the accessory units available for matched use.

Also available are two new specification folders. One (MS-1296) covers the HD-6E crawler tractor and the other (MS-1284) covers the HD-16 DC and D. The latter has a gate fold that combines both the gear transmission drive and the torque converter models in a single piece of literature. (Write: *Allis-Chalmers Manufacturing Company, Dept. RTS, Construction Machinery Division, Milwaukee 1, Wis.*)



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with **BIRD SELF-SEALING TIE PADS**

When you recommend or approve an expenditure for Bird Self-Sealing Tie Pads, you can have complete confidence that it is a sound investment — guaranteeing substantial savings.

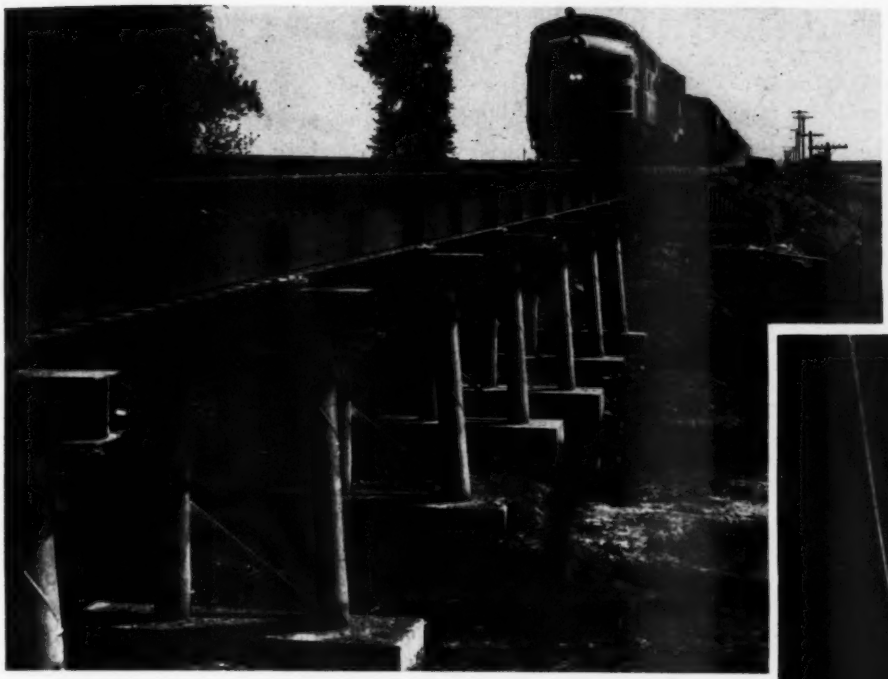
Actual in-track experience over the past 20 years has proved conclusively that Bird Self-Sealing Tie Pads extend the life of new cross ties at least 50%. On older ties which can be adzed down to provide a smooth surface on sound wood, Bird Self-Sealing Tie Pads will double the remaining normal life expectancy of the tie.

Based on the cost of ties today, and the high labor costs for installation, you can easily figure the exact dollar savings that result from increased tie life due to the underplate protection afforded by Bird Self-Sealing Tie Pads. For an interesting booklet giving facts and figures on dollar savings, write to Bird Tie Pads, East Walpole, Massachusetts, Department HTS.

Bird Self-Sealing Tie Pads are Recommended for:

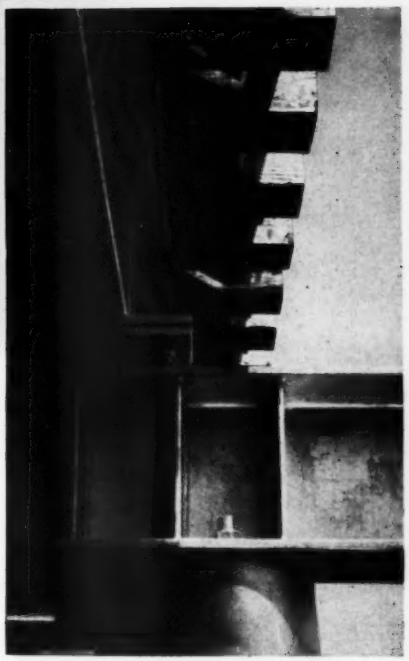
BRIDGE DECKS • CURVES • SWITCH TIMBERS • HIGHWAY GRADE CROSSINGS AND OTHER PAVED AREAS • CROSSING FROGS • INSULATED JOINTS • WITH SMALLER TIE PLATES • PILE CUTOFFS • THROUGH STATION PLATFORMS • OUT-OF-FACE INSTALLATIONS IN RAIL LAYING PROGRAMS • SANDY LOCATIONS • ALL OTHER LOCATIONS WHERE TIE LIFE IS SHORT OR REPLACEMENT COSTS HIGH.

Buy the Best **BIRD & SON inc.** Established 1795 *Buy Bird*



Each pile for the TP&W trestle has a diameter of 12¾ inches. Note interlocking Armco Steel Sheeting abutment wall for additional fire protection.

Close-up of finished understructure. *Arrow points* to Armco Asbestos-Bonded® drip plates for protection against brine drippings.



Armco Steel Pipe Piles *Provide Attractive, Easy-to-Maintain Trestle for T P & W*

When an old timber trestle had to be replaced near Fairbury, Illinois, the Toledo, Peoria & Western Railroad wanted a new structure that would eliminate expensive repairs and all possible fire hazards.

To solve the problem, engineers designed an 8-span, 160-foot-long trestle using Armco Steel Pipe Piling. Each bent includes three steel piles instead of the usual six-pile timber bent to provide an E-72 loading.

Other features of the trestle include steel I-beam caps and pre-assembled steel girder-spans.

The design of an all-steel structure by the TP&W resulted from a complete study of all factors, including a comparison of the railroad's experience with maintenance costs on steel bridges and timber structures.

For more photos, drawings and details on this job or complete information about Armco Foundation Piling, just mail the coupon. Armco Drainage & Metal Products, Inc., Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO DRAINAGE & METAL PRODUCTS, INC.
3078 Curtis Street, Middletown, Ohio.

☐ Send me complete data on Armco Steel Piling
☐ Send me Railroad Engineering Report 5-57 concerning TP&W Bridge 50.85

Name _____ Title _____

Railroad _____

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ARMCO CONSTRUCTION PRODUCTS

ARMCO®

ALLIS-CHALMERS CRAWLER TRACTORS..

first choice on more and m

ALLIS-CHALMERS HD-21

ALLIS-CHALMERS HD-16

225-hp turbocharged engine
Hydraulic torque converter drive
56,260 lb (approx. as shown)

The new HD-21 brings you live power for today's big-tractor jobs—and torque converter drive puts it to work automatically. The HD-21 offers more work capacity—dollar for dollar—than any other big crawler tractor you can buy.
HD-21A illustrated—Two other models available

CHOICE OF TWO OUTSTANDING DRIVES

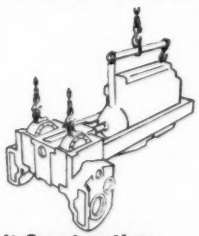
Hydraulic torque converter	All-gear drive
150 net engine hp	141 belt hp
39,090 lb (approx. as shown)	125 drawbar hp

Get up on the HD-16 yourself—and see how it handles jobs ordinarily assigned only to bigger, more expensive crawler tractors. You'll sell yourself—just as more keen-eyed construction men do every day.
HD-16DC illustrated—Five other models available

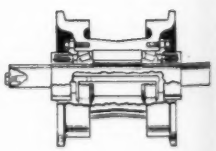
THE ONLY COMPLETE LINE OF CRAWLER TRACTORS THAT

Pioneered and proved by Allis-Chalmers Engineering in Action

Torque Converter Drive gets more work done—automatically provides the right pull or push for every load, at maximum speed for existing conditions. *(Available in HD-21 and HD-16 only.)*



Unit Construction saves valuable time . . . lets you remove any major assembly without disturbing adjacent assemblies.



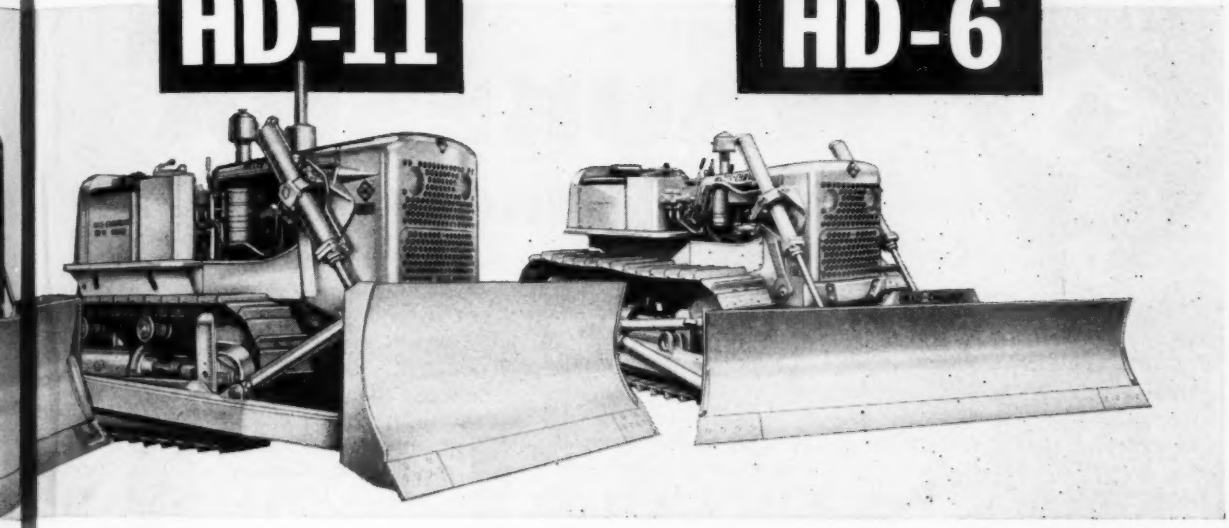
1,000-Hour Lubrication intervals for truck wheels, idlers, support rollers . . . changes daily greasing time into production time.

Look ahead...*move ahead*...and stay ahead wit

more tough jobs

ALLIS-CHALMERS **HD-11**

ALLIS-CHALMERS **HD-6**



94 belt hp

25,960 lb (approx. as shown)

The HD-11 is setting new standards in its size range ... offers you dozens of work-boosting advantages, including the industry's easiest shift pattern. A single shift takes it from any forward speed to any reverse—gets short-cycle jobs done faster, easier.

HD-11B illustrated – Two other models available

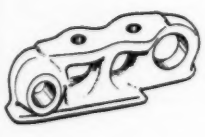
63 belt hp

16,470 lb (approx. as shown)

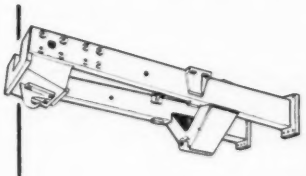
Here's up to 15,500 lb drawbar pull. The HD-6 is the only tractor near its size with big-tractor design advantages—for example, All-Steel Box-A main frame and engine-mounted dozer with direct-lift cylinders for improved weight distribution, accurate dozing and long life.

HD-6E illustrated – Three other models available

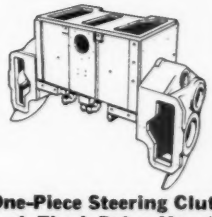
THAT GIVES YOU ALL THESE ADVANTAGES IN EVERY SIZE



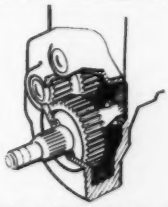
True-Dimension Track heat-treated and machined in the industry's most modern facilities, is setting new track-life records on every type of work.



All-Steel Box-A Main Frame soaks up shock and strain . . . provides improved weight distribution and equipment mounting.



One-Piece Steering Clutch and Final Drive Housing with extreme rigidity and strength . . . line-bored to provide precise alignment of gears and shafts.



Straddle Mounting of All Final Drive Gears with tapered roller bearings on both sides of short, large-diameter shafts . . . provides extra gear life.

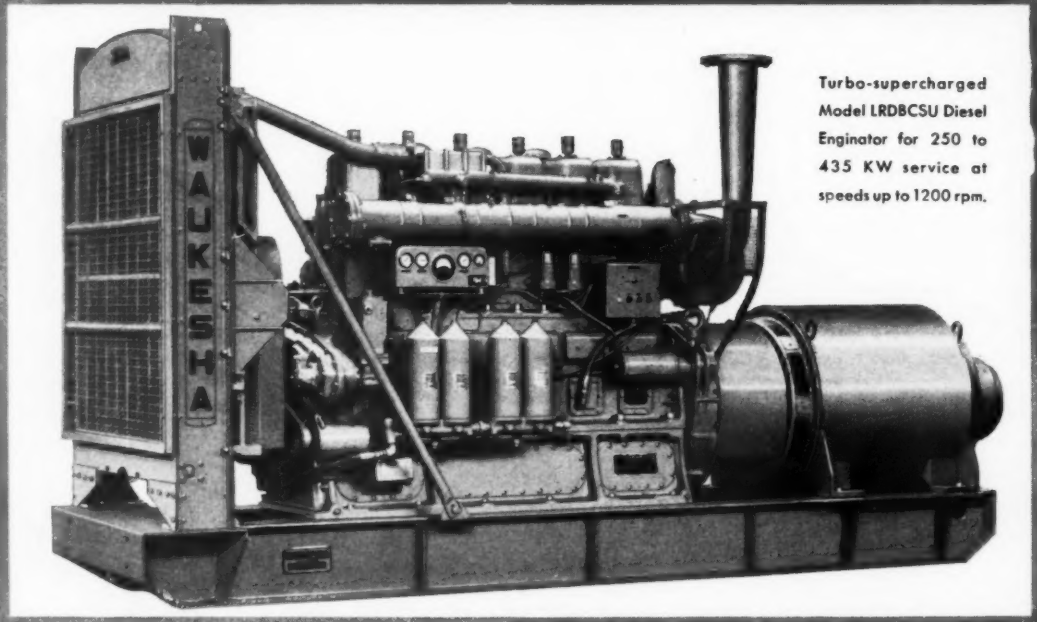
ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

with **ALLIS-CHALMERS**

are **YOU** protected against POWER FAILURES ?

SAVE yourself high costs and inconvenience— of claims, work stoppage, and property damage with

WAUKESHA *Diesel* ENGINATORS®



Turbo-supercharged Model LRDBCSU Diesel Enginator for 250 to 435 KW service at speeds up to 1200 rpm.

● Out goes the power . . . then what happens? At the classification yards? At the terminals—passenger, or freight? Signal equipment? Will the public and your personnel be safeguarded? And perishables properly protected?

The best answer is Waukesha Enginators—not only for stand-by service, but for prime service, too. These Waukesha Engine-driven generator sets are completely automatic and fully equipped with start-up, safety shut-down, and operating controls—in combination voltages with electrical characteristics to specifications. Available for Diesel, gas, and gasoline fuels, up to 800 KW. Write for descriptive bulletins.

Railway Division • WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

371

How to install long plate girders with one crane

With the aid of special erection trusses, spans as long as 110 ft are moved into position wheelbarrow fashion by one locomotive crane.

• It seems easy, the way the Canadian National installs long girders using erection trusses and a single crane. With the crane handling one end of the girder, and the other end rolling on the erection trusses, the member goes into position almost of its own weight.

This isn't the only method the CNR has developed to install girders with a single crane. Another scheme is to use a counterweighted car with the crane in connection with a tie-back arrangement for the boom.

"Although this is an economical and practical expedient where it is only possible to use one locomotive crane in the erection of long girder spans," explained E. J. Napier, bridge engineer of the road's Central Region, "we usually find it less costly to use our erection trusses when we have only one or two long girder spans to erect."

The erection trusses are made in the road's bridge-fabrication shop at Danforth, Ont. They are 5 ft in depth, have 5-ft panel lengths and are varied in length as necessary.

The trusses are designed for a moving point live load and have a capacity for supporting one end of a 110-ft girder designed for Cooper's E-60 line load. The trusses are light enough to be handled with a 40-ton capacity locomotive crane with the boom extended to 110 ft.

Steel running rails, held in position with metal clips and bolts, are provided on the top flanges of the erection trusses. When two of the trusses are in position for installing a girder the spacing is such that the rails on their top flanges are 4 ft 8½ in apart.

The erection trusses are supported at the working end at an elevation that will bring the buggy rails into agreement with the shore rails. The trusses are erected in an inclined position so that the outer end of the girders will be approximately at the elevation of the end bearings when the girders reach their correct longitudinal position.

With the erection trusses in place here's how the girders are installed:

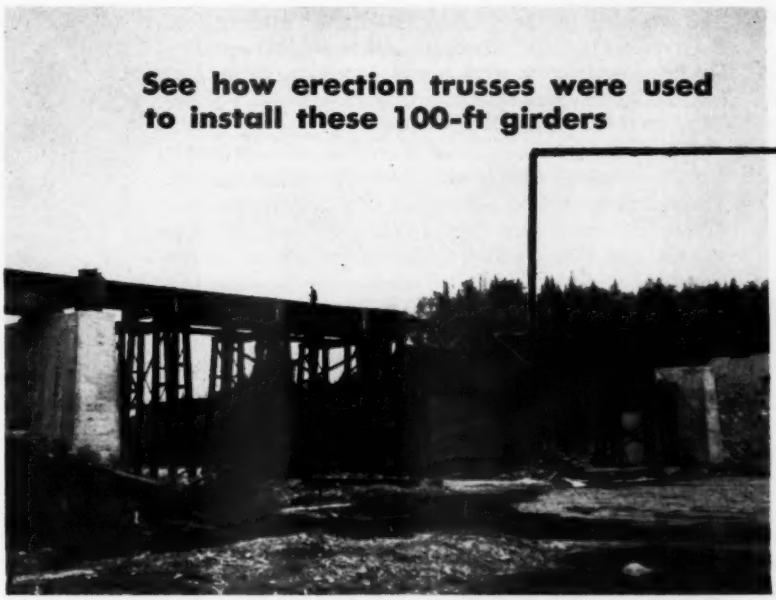
The outer or far end of one girder is landed on a steel buggy. The opposite end of the girder is handled by the locomotive crane.

With the crane supporting one end of the girder the member is simply moved forward on the erection trusses until it is in its correct longitudinal position. The girder is then placed on blocking and jacked sideways into position over the pier. It is then jacked onto the pier members and shored on one side with timber, while the other side is held by a set of rope falls. When this has been done the end being supported by the locomotive crane is swung over into position and shored there.

The same procedure is followed in erecting the second girder. When it is in its final position the lateral bracing and sway frames are applied.

An example of how the scheme works

This view shows falsework in place for erecting a truss span 196 ft 10 in long. The location is a new line the CNR is constructing in northern Quebec. Part of the falsework consists of a 100-ft girder span which was installed by a single crane, using the special erection trusses.



These views show preparatory steps . . .

TEMPORARY steel bents were installed on west side of channel to support floor system of new truss span.

ERECTION TRUSSES were installed over main channel in preparation for erecting 100-ft girders to support floor system of east portion of permanent trusses.

How the erection trusses were used to install 100

The method of installing girders with erection trusses has been used at various locations on the CNR's Chibougamau branch line, now under construction. These jobs have involved both deck-plate girders and girders of other types. The west leg of the Chibougamau line, running from Beattyville, Que., to Chibougamau, was put into operation last fall. Construction work is now under way on the easterly leg which runs from Chibougamau to St. Felicien. Total length of the line is 294 miles.

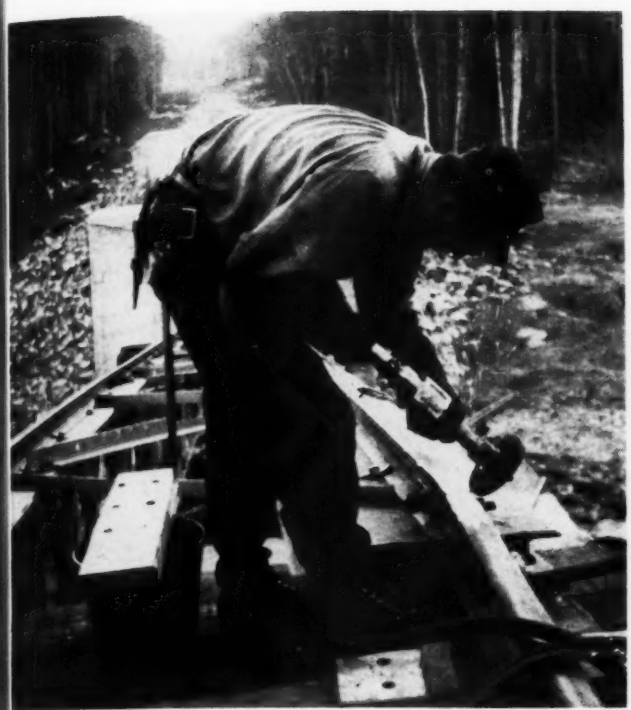
The views on these pages show construction work under way at a bridge location across a narrows at Opawica Lake. The completed bridge will consist of a central truss span 196 ft 10 in long, flanked by a deck-plate approach span at each end. The erection work was carried out by railway forces during the summer months when the water level was low and exposed about one-third of the bottom of the channel on the westerly side. On that side temporary steel bents founded on concrete pads were erected to support a portion of the floor system of the through-truss span.

To permit erection of the floor system for the remainder of the length, a temporary 100-ft girder span was erected. The views on these pages show how the 100-ft girders were placed in position by one crane with the aid of special erection trusses.

The erection trusses were left in place until the permanent truss spans had been completely erected. The falsework girders were then removed, using two locomotive cranes, after which the erection trusses were taken down.

. . . and these show how girders went in

MOVEMENT of girder begins. Erection trusses are designed to support the moving end of a 110-ft girder designed for Cooper's E-60 live load.



WORKMAN grinds joints between track rails and rails on top flanges of erection trusses to produce smooth running surface.

CRANE in background lifts one end of 100-ft girder while near end is carried on buggy running on rails atop the erection trusses.

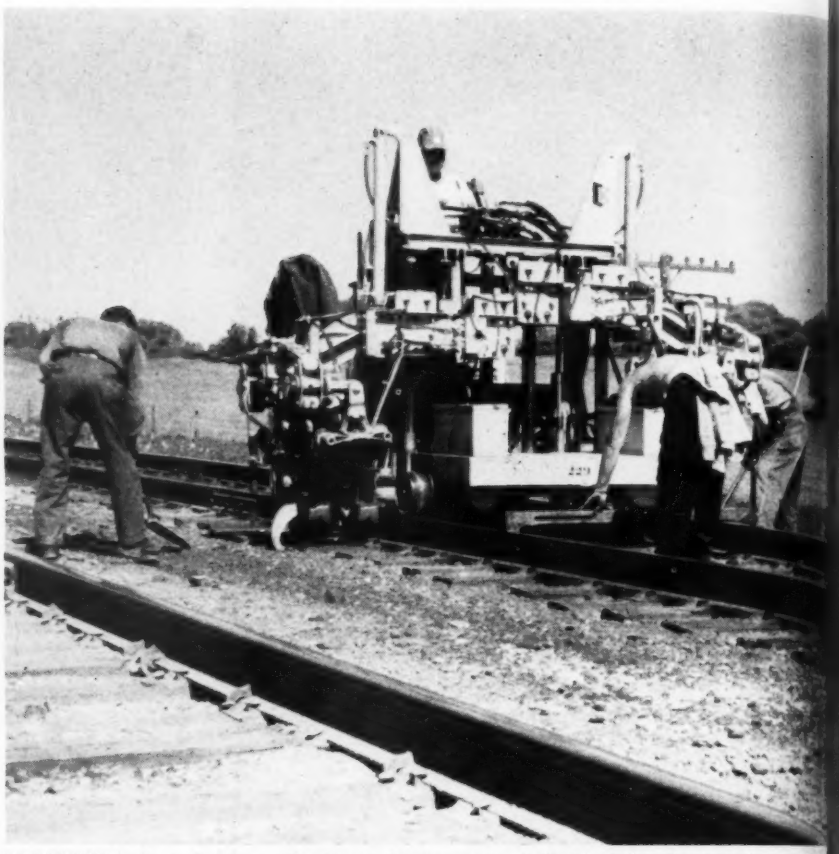
100-ft falsework girders on new branch line

GIRDER is nearing its final longitudinal position. It will be landed on the steel towers and shored there while second girder is installed.

BOTH GIRDERS are now in position. The erection trusses were left in place until temporary girders were removed following completion of the truss span.

HIGH SPIKES, both line and anchor, are driven down ahead of the machines.

FIRST two machines work fairly close together. Lining machine brings up in rear.



HANDYMAN jacks and picks up the ties at the low spots. Ballast is fed to the tamping tools by borers. Man with levelboard finds and marks low spots and usually works ahead of ma

TRACK MA the Handy

Small mechanized gangs put . . . | Spot surfacing o pr

3 machines + 15 men = 1 mile of track per day

• By using a considerable number of small mechanized gangs to spot surface and line, a large road expects to maintain its main tracks in better riding condition. A performance of one mile per day has been exceeded by many of these units.

In the past such maintenance work has been carried out on this road by large extra gangs. This year the road is starting the practice of doing the spotting and lining work with mechanized gangs of 15 men each, plus supervision. The work will be done on a programmed basis.

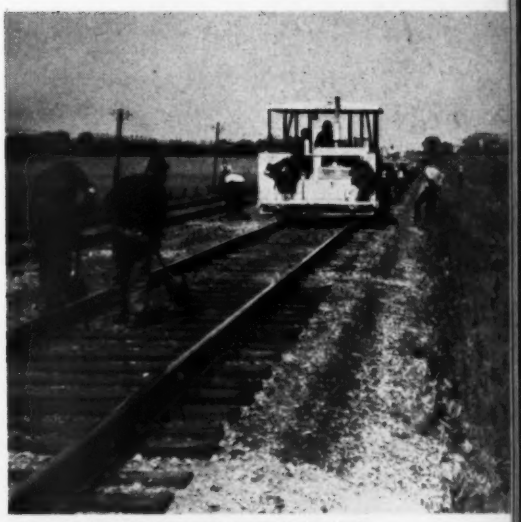
The new gangs are each equipped with a Kalamazoo Handyman for jacking and picking up ties at the low spots. Tamping is done by a Jackson Track Maintainer and lining by a Nordberg Trakliner, the latter being worked in conjunction with a Line Indicator. Set-offs are provided for each of these machines for clearing for trains and for overnight storage.

Each 15-man gang consists of 12 laborers, 3 machine operators, an assistant foreman, a foreman and a general foreman. Two of the laborers do the flagging. Two others work ahead of the Handyman driving down all spikes. Another man works ahead of this machine with a levelboard, finding the low spots and marking the limits on the rails. The assistant foreman directs the spotting of the tamping jack and sights the raises. A laborer works with this machine and feeds ballast to the tamping tools.

The Track Maintainer follows a short distance behind. Two laborers work with this machine, feeding ballast to the tamping tools where necessary. Three more laborers work behind the tamper smoothing and dressing the track. Sometimes one of these men is assigned to help throw in ballast to the Handyman. Also, one of these men works with the general foreman in building set-offs for the Handyman and the tamper.

The foreman is in charge of the lining operation. A laborer assists the machine operator when measuring ordinates around curves with the

TRACK MAINTAINER does the tamping. It works on several ties each side of the one picked up by the Handyman. Two laborers work with this machine, feeding ballast as required.



TWO OR THREE laborers smooth the ballast surface and help out on other jobs.

TRAKLINER, used with Line Indicator, does the lining. Foreman is marking the track throws on rail for curve spiral.

production basis

Line Indicator, setting the indicator for the necessary throws, and in building and dismantling set-offs for the lining machine.

Since the consist will be varied to suit local conditions, not all of these gangs have 12 laborers assigned to them. On some territories, for instance, the spike condition may be such that only one man is required to tap down the high spikes. On other territories, the smoothing and dressing will require only two men.

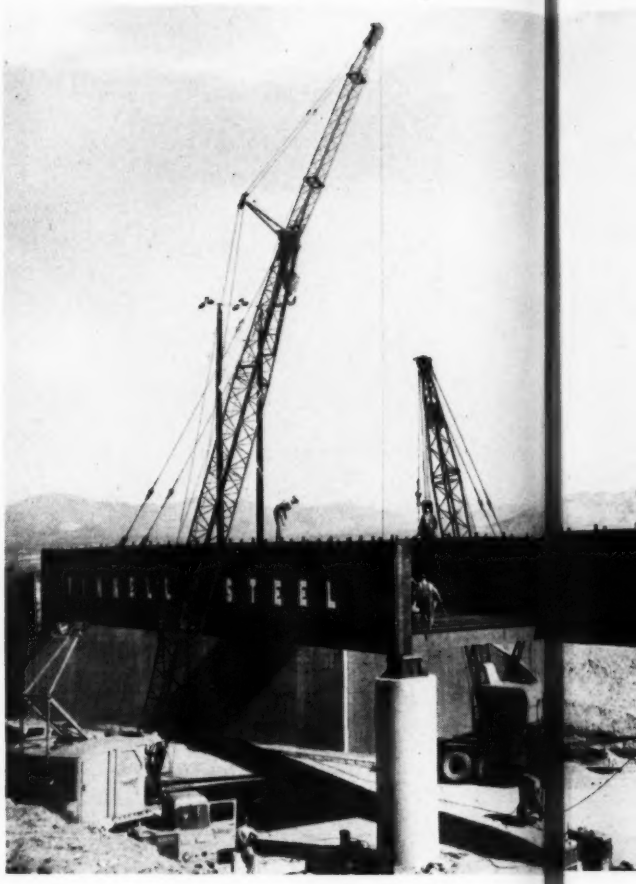
Protected by work orders

In addition to the flagmen, the gangs are further protected by work orders within specified mile-post limits. These are restrictive orders; trains are required to approach prepared to stop anywhere within the specified limits. A portable telephone enables each gang to learn of the proximity of approaching trains so as to avoid delays and minimize unproductive time when clearing for trains. The set-offs are kept within the limits of the territory specified by the work order.

These gangs have all at least equalled, and many have exceeded, their average expected performance of one mile of track per day. Expenditures have been reduced, permitting the road to schedule larger spotting programs. The use of these gangs insures covering all of the heavy-traffic main tracks scheduled and some of the secondary main tracks. As a result of its new plan, the road expects to maintain its tracks in better riding condition than formerly.

THE BRIDGE, on a 55-deg skew, has railings of corrugated guard rail that rise 10 ft 8 in above girders to prevent ore from falling on highway.

Welded bridge in



The first welded railroad bridge to be built in California is now in service. Designed by the State Divison of Highways it carries the single-track line of the Mojave Northern across a relocated highway. Consisting of two through-girder spans it is a ballast-deck structure with special features of design introduced for the purpose of reducing fatigue effect on welded connections.

• The fact that a new bridge is of welded construction is sufficient reason for commenting about it.

This particular bridge, however, has other noteworthy features. For one thing, the floorbeams are fastened with high-tensile bolts to welded connections so designed as to provide "give" and flexibility. For another, the deck of the single-track bridge is planked over to carry the railroad's service roadway across the structure. Finally, a barrier or fence 10 ft 8 in high has been superimposed over each girder to prevent lading from falling on the roadway below.

This unusual bridge has been built to carry the Mojave Northern (owned and operated by the Southwestern Portland Cement Company) over a relocated highway (Route 31) between Victorville, Calif., and Barstow. A welded structure was preferred by the State Division of Highways which designed the bridge. The fact that the Mojave Northern is a small local line carrying ore to a plant at Victorville made the structure a "likely spot to establish this precedent for welded steel," to use the words of the Division of Highways. Basically, the bridge is a typical through-girder—floorbeam-type structure carrying a single track. It crosses the highway on a 55-deg skew and consists of two 101-ft spans. It is carried on concrete abutments and cylindrical concrete piers. The live load for which the bridge is designed is approximately equivalent to Cooper's E-51 for the girders and E-53 for the floorbeams.

The bridge was designed in accordance with AREA and American Welding Society specifications. According to the State Division of Highways, "several features in the design of the girders are of interest in that they serve to build up the resistance of the girders and connections against the inherent weakness of the welded type for railroad loading." The girders, which are 10 ft high, were fabricated completely by welding. Longitudinal stiffeners were used on the outside to improve the appearance and to reduce the web thickness.

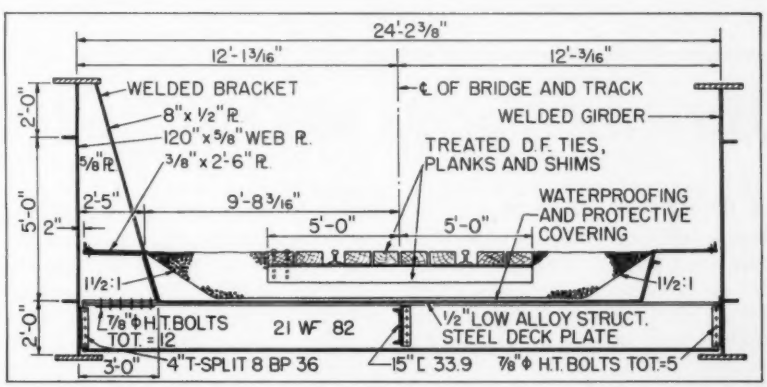
On the inside faces of the girders vertical stiffeners were used in addition to brackets, spaced 12 ft apart, for stiffening the compression flanges. The connections between the bottom of the brackets and the top of the floorbeams are each made with 12—⅞-in high-tensile bolts. By this means the initial tension developed in the bolts is used to carry into the floorbeam the moment developed by lateral forces acting against the girder flanges. Thus the full strength of the floorbeam is maintained around this rigid corner.

At points between the vertical stiffeners the floorbeams are each connected by five ⅞-in high-tensile bolts to a 4-in T section welded to the girder. The T sections were formed by splitting 8-in 36-lb bearing piles. The web of each T is coped from a height of 4 in above the floorbeam connection and its flange is welded to the girder web along the vertical and top edges. The purpose of using the T-section connections in place of welded connection plates is to reduce the repetitious effect of live load impact on the welds at these points. It is believed that the bending in the flange of the T will provide "give" and flexibility, tending to reduce the possibility of fatigue failure.

ge in California has 101-ft girders

THE GIRDERS of one span have been erected and floorbeams are being installed. Note that brackets, stiffeners and T-section connections for floorbeams have already been welded to girders. The webs of the girders are 10 ft high.

THE DECK of the bridge consists of ½-in Kaisaloy plate, a low-alloy steel. Installation of the plates required approximately 4000 ft of field welds.



TYPICAL SECTION shows plank decking installed to carry service road across bridge. Note how floorbeams are bolted to T sections welded to girder webs.

The bridge is a ballast-deck structure with the deck consisting of ½-in Kaisaloy plate, a high-strength alloy steel manufactured by the Kaiser Steel Corporation. This was provided in 4-ft by 20-ft sections with the ends bent upward to form curbs on the same angle as the brackets. The openings between these plates and the webs of the girders were covered with plates of the same material. A space 2 in wide is left between the web and the edges of the plates. Angles are fastened to the edges of the plates to prevent material from falling through the 2-in openings.

In the vicinity of the bridge the railroad has a service road paralleling its track, which had to be carried across the bridge. To avoid building a wider structure, the service road is detoured onto the track alinement, and crosses the bridge on a planked roadway 10 ft wide.

To prevent material falling from ore cars onto the roadway below, the railroad requested that vertical barriers 10 ft 8 in high be placed atop the girders. For this purpose typical corrugated metal guard rail was used, which was placed in three tiers to give the required height. At the acute angle corners of the bridge this railing is continued beyond the structure at a height of 4 ft 4½ in above ground. At the obtuse angles, where rocking of the ore cars is a possibility, the railing was continued for 27 ft at a height of 10 ft 2 in. All abutment wingwalls were built to a height of 3 ft above the tops of the fill slopes for additional protection from falling material.

The steel for the bridge was fabricated and erected by Vinnell Steel, Irwindale, Calif. All welding involved in fabricating the girders, and in applying all beam and bracket connections, was done in the shop. In welding the deck plates in the field a total of approximately 4000 ft of welds were made.

On city elevated line . . .

Use preassembled panels on track re

The usual methods employed by most roads for rehabilitating track will not work economically or satisfactorily on the elevated lines of a city transit system. For one thing, space is limited on the deck for unloadng and storing any large quantities of material. Work gangs must be small to insure adequate supervision and men must move cautiously to avoid accidents.

The New York City Transit Authority has developed a solution to this problem. Using mass-production methods it preassembles the track in panels. Installing track in this manner, it is found, eliminates many problems and reduces costs.

By **R. E. Dove**

• "So you want to go out to see how we lay track in panels?" asked Walter L. Schlager, Jr., assistant general superintendent maintenance of way, New York City Transit Authority. "Before you see the work let me explain briefly what we are doing, and why.

"We are trying out the panel method on our elevated lines. We preassemble the track in 33-ft lengths. The panels are complete with rails, ties, tie plates, tie pads, spikes, rail anchors, the outer timber tie spacers and bolts. The track we are rehabilitating is also laid with 33-ft rails with square joints.

"The panels are preassembled in our maintenance-of-way yards and hauled to the site on trucks. Sections of the old track are cut as required and a mobile crane lifts them out and replaces them with the new panels.

"We have been doing this only for a relatively short time and are realizing savings and are doing the work in less time than by our old methods. So we know our thinking is headed in the right direction.

"Right now we are working on our Myrtle Avenue line. Some years ago this elevated line was under consideration for removal. However, a definite decision was not easily reached and action was deferred for several years. Meanwhile, only maintenance essential to safety was carried out on this line, and only our lightest equipment was run

How the panels are installed

• On reaching the work site, we saw a truck crane in the middle of the street with its boom erected in the space between tracks. Two tractor trailers, having long flat-bed bodies, were serving the crane. One was loaded with the track panels and the other was being used to receive the old track sections as they were cut out and removed from the deck. The trucks moved with the crane and each alternately moved up to and away from the crane as required.

Vehicular traffic was being routed in two lanes south of the crane to prevent any vehicle from passing under the north track which was then being rehabilitated. Also, the north sidewalk at the street level had been cordoned off with ropes to keep pedestrians from wandering under the track where they might be struck by falling objects. Four men were keeping traffic moving smoothly, including that at the intersections, and they also handled the guide ropes of swinging loads.

"On this job", Mr. Quinn explained, "the crane works in the middle of the street. There is enough space between tracks for passing the panels through and we avoid any possibility of striking the projecting shop signs and overhead wires. Later, I'll show you another job on our Astoria line where the crane works from the sidewalk."

"The panels", he continued, "provide long ties for supporting walks on each side of the track. But you'll note that they are received with the long ties all projecting on the same side. This is done so that the truck loads will come within the 13-ft load width specified by the city. Also, it is easier to raise the narrower panels to the structure."

"We have the track from 9:30 in the morning until 3:00 in the afternoon", Mr. Boes stated. "Then the track is turned back to the operating department. In that time we'll install five new track panels complete."

I expressed a desire to observe the work from "upstairs," so we drove to the nearest station, climbed the stairs, and started down the track. The walk and hand rails on each side had not yet been erected, so we stepped from tie to tie. "Treat that third rail as if it is always alive", warned Mr. Quinn, "even though you're told it's dead." Presently we came to several rails lying between the running rails. They were shorter than the running rails and were to be used as new inner guard rails. Other rails also were lying on the deck. These were from the partially dismantled third rail.

Rails are reused

At the work site, we noted that the running rails already had been removed on each side for five rail lengths. These rails were in good usable condition. When the truck carrying the new panels had been unloaded, the released rails were placed

k renewal project

over it. Then, last year, the Transit Authority decided to keep the line in service and we were handed the job of rehabilitating it. You will see some pretty poor timber conditions, but I'm sure you will understand that this is not our normal maintenance standard.

"Now I'll turn you over to John J. Quinn, our superintendent, track and structures. He'll show you what we're doing." While in Mr. Quinn's office, George Boes, the superintendent of track, joined us and we proceeded on a tour of inspection.

En route to the work site Mr. Quinn said, "You name any problem that the Class I roads have, and I'll tell you we have it too. Tie, ballast, rail, tie plate and anchor renewals—we have them all. Also, we have bridge, tunnel and station maintenance. We must carry out our work under very heavy traffic conditions. In addition, we generally have to work in areas limited in size and clearance.

"We have flood problems, too," Mr. Boes put in. "When a 30-in water main breaks and floods our subways, believe me, we have work to do and it must be done quickly!"

"You'd be surprised what a flood does to our track," Mr. Quinn continued. "The effects of a flood are felt for years afterwards. Every cubic yard of ballast we renew in our subways must be excavated, loaded, brought out and disposed of. Where floods have occurred, the ballast is in a cemented condition and we can't pick it out. We have to use air guns to get it loose from the concrete floor."

OLD DECK is cut into panels, picked up by a crane operating from the street below and loaded onto a truck.

on it and sent to one of the preassembling areas. There they were reused in the construction of new track panels. The third rail and the walk and handrail on one side also had been removed.

A man with a gas-powered chain saw cut the guard timber spacers of the old track into sections about one-half rail-length long. Another man, with a cutting torch, cut the inner steel guard rails at about the same points. Two other men, with power wrenches, unscrewed the nuts from the bolts which anchored the deck to the girders. The deck was now ready for removal in sections.

To remove a section, two cable slings were passed under the guard rails and fastened to the hook of the crane. Two of the sections were load-

TOP SURFACES of steel girders are scraped clean of rust before new track panel is placed. New panel in foreground has not been finally lined.

NEW PANEL is lifted off a flat-bed truck and raised between tracks to the deck by a mobile crane.

Positioning and fastening

POSITIONING of the new panel is done by men with bars. The long ties having tie plates at right, will be slid over to the left to provide supports for sidewalk.

CLIP BOLTS, attaching panels to girders, are installed from truck-mounted boom.

ed onto one of the flat-bed trailers, which then pulled away a short distance. The second flat-bed trailer backed to the crane, and cable slings were passed around the rails of the upper new track panel. Guide ropes were attached at each end of the panel, and it was ready for raising.

Meanwhile, as each of the old deck sections was removed, the upper surfaces of the deck girders were scraped clean of rust and dirt. As the new track panel was raised, it was guided through the opening between tracks and the crane boom was moved to suspend the panel just over the girders. Two men working from the deck at each end of the panel used bars to guide the section into proper position. The panel was then lowered to rest on the girders and the crane proceeded to the next panel.

Other men on the deck removed the nuts and bolts which held the long ties for the south walk in their temporary offset position. Using track jacks for raising the rails slightly to permit clearing of the applied tie plates, the long ties were then shifted into their final positions. New holes were drilled in the timber guard spacers and the bolts, washers and nuts applied. It was explained that the timber spacers are used only on this line. On the other lines, long wrought-iron straps are the standard spacers.

When the five new track panels had been placed, the flat-bed trucks were released and two others replaced them, one with more track panels and the other empty.

Equipment is leased

"These pieces of equipment are leased with their drivers from Durkin-Klosk Hauling Corporation," explained Mr. Quinn. "Without them we would have to bring all of the material in by cars and unload it on the deck. Storage space, even temporary, is at a premium up here. We would first have to locate places on this deteriorated walk strong enough to support such loads. Then the work would have to be done piece by piece and by hand. The old material would have to be loaded onto cars and taken to a storage yard, then loaded onto hired trucks and taken to an authorized disposal point.

"With our panel method, the trucks are here and take the old material direct from the work site to the disposal point. The other flat-bed truck goes to the preassembling yard with the usable main-track rails, which are unloaded by a truck crane. Five new track panels are then loaded onto the flat-bed. In the afternoon, the trucks are loaded up so that they can go direct to the work site the next morning.

Uses truck-mounted boom

When questioned about anchoring the deck to the girders, he stated that this operation could best be seen from the street. Back on the street, a special truck, equipped with an air compressor and a Skyworker boom, the latter having a two-man crow's nest, was pointed out. It was manned by three men, a truck driver and two trackmen. The trackmen were raised in the crow's nest to the point of work under the track deck. In addition to moving the truck, the driver also manipulated the controls for raising and positioning the boom. Pneumatic power was available at the crow's nest for use of power tools.

The trackmen were using a pneumatic wood borer to drill holes through every other tie for anchor bolts. A supply of washers, nuts and clips was hung in a sack over the side of the crow's nest and these were applied to hold the new deck to the upper flange of the girders. A pneumatic nut runner speeded the work.

After we had watched the progress of this work for a while, Mr. Quinn said: "We can place the track panels as fast as they are produced. Let's go and see how they are made at one of our preframing yards."

How the track panels are produced

The preplating and assembling of ties with rails into 33-ft track panels are done in framing yards. High output is obtained by the use of machines and by positioning materials for efficient fabrication.

• The mass-production method is being used by the New York City Transit Authority to preassemble track in 33-ft panels. The framing and assembly work is being done at its Corona yard in Queens, its Thirty-eighth Street yard in Brooklyn, and at its East 180th Street yard in the Bronx.

The assembly line at the Thirty-eighth Street yard is the straight-line type. That at the Corona yard is divided into two parallel lines, one for applying the tie pads, plates and hold-down fastenings to the ties and the other for applying the ties to the rails, including anchorage.

All materials, except rail, are shipped to the yards in car-load lots. The rails are usable rails recovered from the track being rehabilitated and are brought to the yards on long flat-bed trucks. Each yard is served by a leased truck crane which unloads, stock piles and distributes all heavy materials, as well as loads the finished panels onto flat-bed trucks.

Has track for template

At the Thirty-eighth Street yard the assembly line is about 500 ft long. The working surface is the top of rail of a track built on level ground with widely spaced ties. This track supports a similarly constructed track which serves as a template for applying tie pads, plates and hold-down fastenings to ties at standard gage. The rails of the template are held in line by four ties per 33-ft rail. These have tie pads and plates and are spiked permanently to the template rails. Planks are nailed along the south ends of these ties to serve as a line-side stop board for the template. A supply of new 14-in double-shoulder, canted tie plates, Bird tie pads, and kegs of Spencer twisted-shank cut spikes are distributed along the south side of the template track. Also, a skid track has been constructed along the north side of this track.

The starting end of the assembly line is where the tie pads and plates are spiked to the ties. The ties are adzed and creosoted, 6-in by 8-in. in section and 8 ft 6 in, 9 ft and 12 ft 6 in long. The 8-ft 6-in lengths are standard. The 9-ft lengths are used for supporting the third-rail insulators. The 12-ft 6-in lengths are for supporting sidewalks in addition to the track. The ties are not prebored because of the fact that the many different applications and conditions on this road require a wide variety of spiking conditions. They are shipped by the Koppers Company in gondola cars and are stock piled on one side of the farming yard by a truck crane.

Using cable slings, the truck crane, making several trips, totes about 110 of the 12-ft 6-in ties to the skid track at the starting end of the assembly line. These are then slid endwise over to the assembly line and inserted under the rails. Eleven ties can be inserted side by side between the fixed ties of the template track and

TEMPLATE track has a stopboard at right for centering the ties under the rails. Tie pads and plates are then applied.

Plating the ties

HOLES for hold-down and anchor spikes are drilled by a dual tie drill. Spikes are started, then driven down by an air hammer.

Assembling and loading

TIES are made into panels at the framing end of assembly line. Paint marks on template rails assist in properly spacing the ties.

COMPLETED PANELS, 33 ft long, are loaded five tiers high on flat-bed trucks for hauling to construction site.

they are pushed up against the stop board. About the same number of the 8-ft 6-in lengths also are brought up and fitted between more of the fixed ties. Adjacent to them are inserted 22 more of the 12-ft 6-in lengths and about the same additional number of the 8-ft 6-in lengths. The latter are for joint ties and require joint plates and special spiking.

Machine drills spike holes

While the ties are being inserted beneath the template rails, four men, working two to a rail, pry the rail up with bars and apply tie pads and plates to the ties. Behind this operation, two Nordberg tie drills, one for each rail, go to work at the starting end and bore holes for the spikes in the hold-down positions. Two men follow setting spikes and another, equipped with a C-P pneumatic spike hammer, drives these spikes down. The tie drills then go again to the starting end and bore holes for the line spikes.

Track jacks are used to raise the template track slightly and the plated ties are slid from beneath the template back onto the skid track. They are now ready to be used either for making up into track panels or as necessary for use by other gangs. Many of the 8-ft 6-in lengths are used in the subway for replacements. If for use in the subway, they are loaded by the truck crane onto cars. If they are for the track panels, they are picked up and moved forward by the crane to the framing part of the assembly line.

At this end of the assembly line the template rails are marked with paint to indicate the exact position of each tie in the panel. The first plated tie placed in position is a joint tie 8 ft 6 in long. The next two ties placed are 12-ft 6-in lengths. However, they are not both placed on the template with the tie plates lined up to receive the running rails. The second long tie is reversed so as to produce a support later for a side walk on the opposite side. This is a temporary expedient so that when the completed panel is hauled on a flat-bed truck it will comply with the city's load width limit of 13 ft. The next tie placed on the template is again a standard length, but it has the standard intermediate tie plate. This procedure continues until a total of 22 ties has been placed for a 33-ft track panel. The last tie in the panel is a long length equipped with joint plates.

The usable 100-lb rails are set on the ties by the crane. Rail spikes are then started by hand and driven home by a C-P spike hammer. Spacing timbers, 6 in by 6 in. in section, are placed outside the running rails. Holes are drilled through them and each tie with a pneumatic wood borer. (Wrought-iron spacers are standard for all lines except the Myrtle Avenue line.) Guard rail bolts are then applied, head down, with nuts and washers and are tightened by a pneumatic nut runner. An exception is made in the bolting procedure with the long ties which are in the offset position. On these ties the bolts are applied head up so they can be quickly spotted in the field and the nuts removed from underneath to permit sliding these ties into their correct position. Ten Improved Fair anchors are applied to each rail, two of which are for reverse movement.

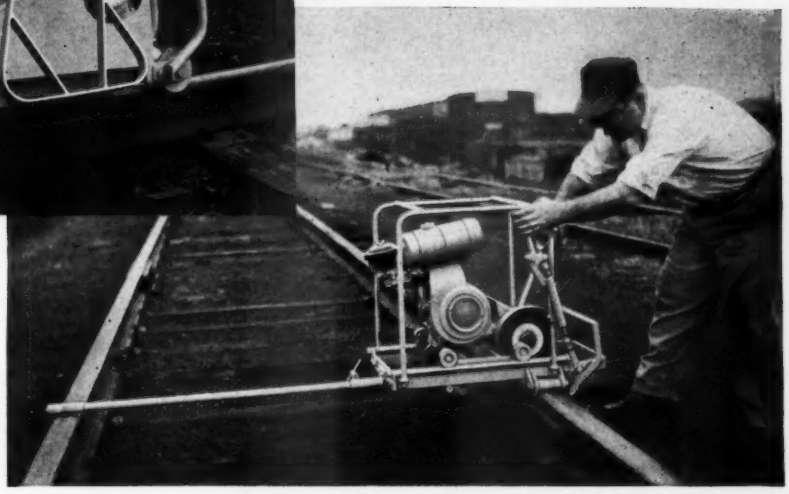
All material goes together

Work proceeds on one panel until it is completed. Five panels are loaded onto a flat-bed trailer truck. Also loaded with them are the necessary joint bars, track bolts, prefabricated hand rails and posts, walk planks and hardware, and the protection boards for the third rails. This practice insures having all necessary material available in the field, except the bridge clips, as furnished by the Rails Company, for anchoring the panels to the girders. The latter material is carried by the men doing this work from a crow's-nest boom on a truck.

The framing plant at Thirty-eighth Street yard is operated by a foreman and a crew of 12 men. The entire output of this and the Corona yard is used up daily by two day crews installing the track panels and by two night crews making spot tie renewals in the subways. Similarly the yard at East 180th Street, which we did not visit, produces enough panels for one day crew and three night crews.

To get increased production, the NYCTA is planning a second 500-ft assembly line at the Thirty-eighth Street yard. The overhead trolleys also will be removed at this yard to permit free boom swinging and faster crane movements. Also, the road is working on a new tie drill which will simultaneously drill eight holes, four to a rail, in the ties.

MODEL P-45-A PORTABLE RAIL SURFACE GRINDER. Powered by 4-cycle, air-cooled gasoline engine developing 7½ hp at 2600 rpm. Adjustable V-belt drive acts as overload release.



MODEL X-60 PORTABLE CROSS GRINDER. Powered by 4-cycle, air-cooled gasoline engine developing 3.4 hp. Hand-actuated lock control lever allows easy alignment with rail joint.

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Model P-45-A, a cup wheel grinder, is mainly used for grinding welded rail ends and for removing mill tolerance and mill scale before heat treating rail ends. It leaves a very smooth and highly polished surface.

Model X-60, cross grinder or slotting machine, quickly removes overflowed metal at rail joints. It is also used with out-of-face rail end welding crews and for cross grinding rail ends behind the crews.

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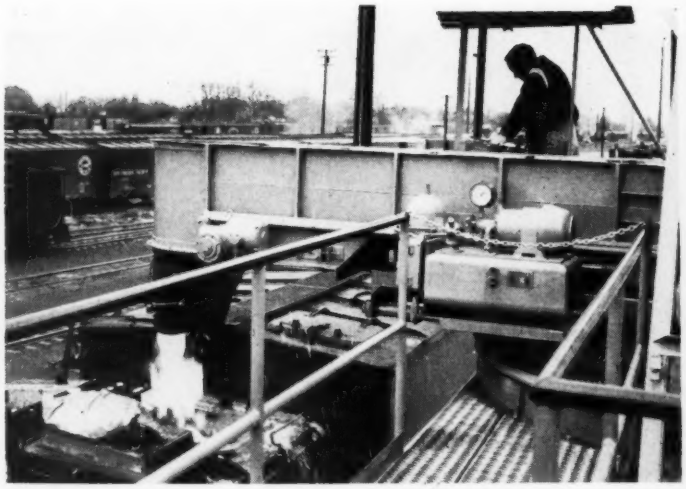


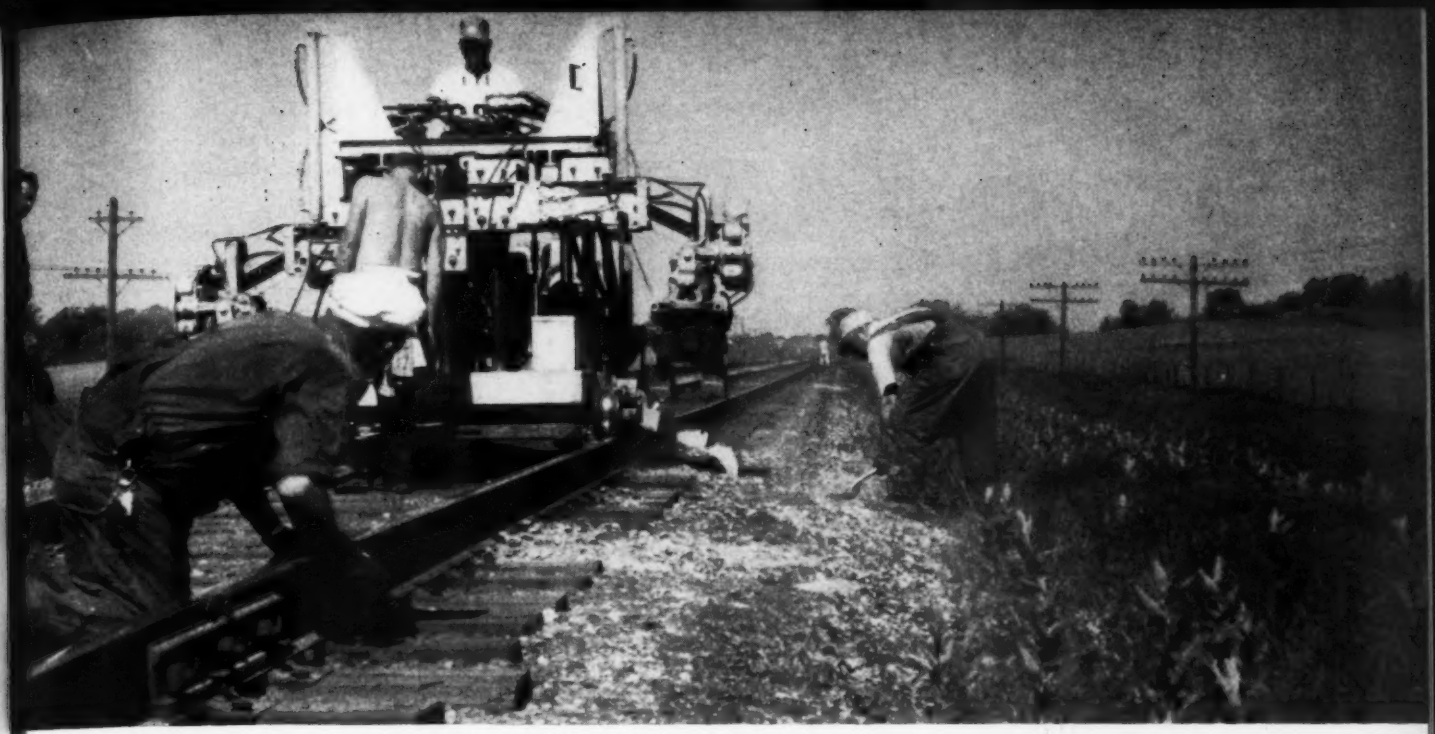
CAR ICING on the Southern Pacific at Eugene, Ore., presented a special problem. The road wanted to ice cars of perishables in a minimum of time and regardless of their location in a train. The machine shown in these views was the answer. Powered by a Waukesha 150-hp gasoline-engine-driven generator, it is a self-contained unit which operates on a track between two body tracks. It is comprised of a tractor and four 4-wheel trailers, which carry a total of 60 tons of ice. A chain conveyor in the trailers delivers the ice to a breaker in the trailer. An elevator delivers the broken ice to a cross conveyor that discharges it into the hatches.

News briefs in pictures . . .

◀

AN OFFICE BUILDING was needed quickly by the Boston & Maine at a new yard designed for handling piggyback traffic. An Armco S-2 building was selected. Put up in short order by an inexperienced crew it is insulated and heated with an oil burner, and has ten windows to give visibility in all directions.

TIMBER PILES in a 1½-mile trestle on an abandoned branch line of the Frisco were reclaimed for use in highway bridges. The branch is a 17-mile line between Davidson, Okla., and Vernon, Tex., and was abandoned following the heavy floods that occurred in that area in 1957. The reclaimed trestle extended across the Red river. To salvage the piles, which was done by a contractor, it was necessary first to excavate heavy deposits of mud and sand from around the members. This was done by two Caterpillar D6 tractors equipped with winches and bulldozers. The winches were then used to yank the piles out.



KALAMAZOO "Handyman" does 5 jobs quickly:

Raises, nips, levels, jacks, and tamps ties

Now offered with a split head arrangement to allow the tamping of either rail separately or both rails at the same time. Raises, nips, levels, jacks and tamps ties with minimum settling. Electric vibratory tamping action. Improved hydraulic system with Vickers components. Suitable for use with wire surfacing device. Send for Bulletin HM-1B

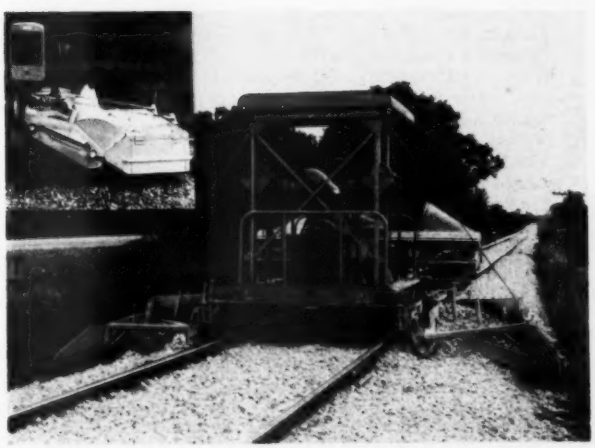
Kalamazoo Model "29A" Sweeper and Equalizer

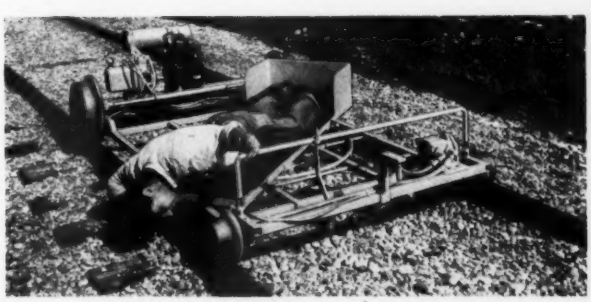
Transfers ballast from shoulder onto ties for tamping. Shapes, smooths and levels shoulder and berm. Broom assembly moves excess ballast from center of track to outside. Sweeps up thoroughly after all other operations are completed. Broom assembly also available for installation on your own units. Send for Bulletin TS-2.

Kalamazoo Model FSC Foreman's Car

Makes track sighting faster, easier, more accurate on raising, surfacing, spotting and construction operations. Smooth hydraulic drive has Vickers components. Operator's platform with padded cushion rotates 360°. Send for Bulletin FSC-1.

KALAMAZOO "Handyman" in operation near Adeline, Illinois, on the Milwaukee Road.





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Products

Easy starting with . . .

Short-stroke engine

NOW available is a 6.6-hp, four-cycle, short-stroke, air-cooled engine with a retractible starter. According to the manufacturer, this unit weighs 75 lb and is well adapted for use on concrete mixers, lift trucks, weed cutters, power sweepers, rollers, snow-removal equipment, pumps, tractors, sprayers and augers.

Easy, quick starting is said to be provided by a self-contained starting unit attached to the engine, eliminating the need for a rope. The customary rotating grease screen is positioned under the starter housing, and insures circulation of clean cooling air over the engine cylinder. Head is aluminum alloy with deep fins spaced for efficient cooling. *Kohler Company, Dept. RTS, Kohler, Wis.*

Greater strength for . . .

Aluminized steel

ALUMINIZED steel Type 2 has been made available in a new type of corrugation for industrial roofing and siding. The new type is called Deep Corrugation and has a 2 2/3-in pitch and ⅞-in depth. On a thickness-for-thickness basis, the new type is said to be much stronger than the standard 2½-in by ½-in corrugation. As for durability, the manufacturer states that 19-year corrosion tests in a mild industrial atmosphere show that Type 2 aluminum coating will last at least three times as long as the coating on commercially coated galvanized sheets. After weathering, it is said to have the same appearance as solid aluminum. The producer also states that heat reflectivity is excellent, either from heaters, furnaces or from the sun. Conventional fasteners may be used, with hot-dipped galvanized fasteners being satisfactory for mild industrial atmospheres and stainless-steel fasteners being preferred for more severe conditions. Lead or neoprene washers are recommended for water tightness. *Armco Steel Corporation, Dept. RTS, Middletown, Ohio.*

Fast positioning with . . .

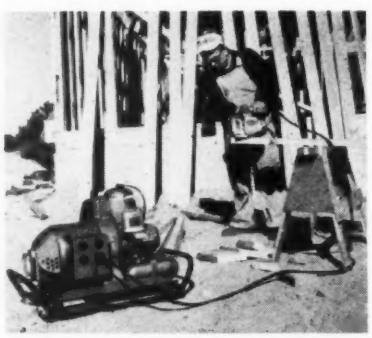
New tie handler

TWO to three crossties can be positioned for installation in a minute by an experienced operator through the use of a new machine designated the Model 57-BP RTW Tie Handler, according to its manufacturer. Also, this machine may be used for piling old ties, stacking new ties, handling bridge timbers and for setting light track equipment on and off the rails.

Completely hydraulic in operation, this machine is powered by a 4-cylinder air-cooled gasoline engine having an electric starter. The self-propelled unit has a two-speed transmission and is capable of traveling 7½ to 15 mph in either direction.

The hydraulically operated tongs are mounted at the end of a 15-ft box-type boom. A 5-ft intermediate boom section is available as an extra. The boom, engine, controls and operator's seat are mounted on a platform that rotates through 360 deg. The boom may be operated through a vertical angle of 60 deg—30 deg up or down from a position parallel with the track.

The unit's overall length is 10 ft 8 in, its height is 6 ft and its width is 5 ft 5 in. Transverse set-off wheels also are available as an extra for this 7,000-lb machine. *Railway Track-work Company, Dept. RTS, 3207 Kensington Avenue, Philadelphia 34, Pa.*



Small-tool power from . . .

New generators

TWO new 3,000-watt gasoline-engine-driven generators have been announced for providing a dependable power source for operating electric drills, saws, concrete vibrators, floodlights and other power tools at the construction site. These new units, a 115-volt, 60-cycle Model 8A115 and a 115-230-volt, 60-cycle Model 8A115/230, weigh only 140 lb for easy carrying to and around the construction site. Both generators feature 4-per cent voltage regulation and a generous overload capacity to insure top performance, less maintenance and longer life for the power tools. An exclusive generator design is said to eliminate d-c brushes, commutator and d-c armature windings for keeping maintenance costs at a minimum. Power is provided by a two-cycle gasoline engine directly coupled to the armature shaft. *Homelite, Dept. RTS, Port Chester, N. Y.*

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RAIL GRINDING

RAILWAY TRACK and STRUCTURES

What's the answer?

To be answered in October

Do you have an answer to any of the questions listed below? If so, send it in. Payment—based upon substance and length—will be made for each published answer. If you'd prefer that your name be withheld, we'll gladly comply.

DEADLINE: August 29

1. When joints are pumping mud on a ballasted-deck bridge, what corrective measures can be used? Explain.

2. Where an old bent is in the way of a proposed pier or new pile bent, how can the old piles be removed economically? Describe method and equipment used for this purpose.

3. What is the best way to remove excess metal from stock rails—gouging rod, cutting torch, or heating and chiseling? Why?

4. What can be done to reduce or eliminate the formation of fuel deposits on the ceilings of diesel shops? What is the best method of removing such deposits?

5. Are concrete foundations desirable for supporting car retarders? If so, how can they be kept in line and surface? If not, what is the best foundation?

Send answers to:

What's the Answer Editor
Railway Track & Structures
79 West Monroe Street
Chicago 3, Illinois

Do you have a question you'd like to have answered in these columns? If so, please send it in.

Cycle surfacing and spot tamping

Where tie renewals and out-of-face surfacing are done on a cycle basis, is it also necessary to have spot-tamping gangs? Explain.

Are necessary

By E. L. Moyers, Jr.
Rodman
Illinois Central
Vicksburg, Miss.

The necessity for spot-tamping gangs is dictated by the length of time elapsing between out-of-face surfacing and tie-renewal cycles. It is also influenced by the number of trains, tonnage, maximum speed of trains, condition of subgrade, ballast, rail, ties, weather, and other local conditions.

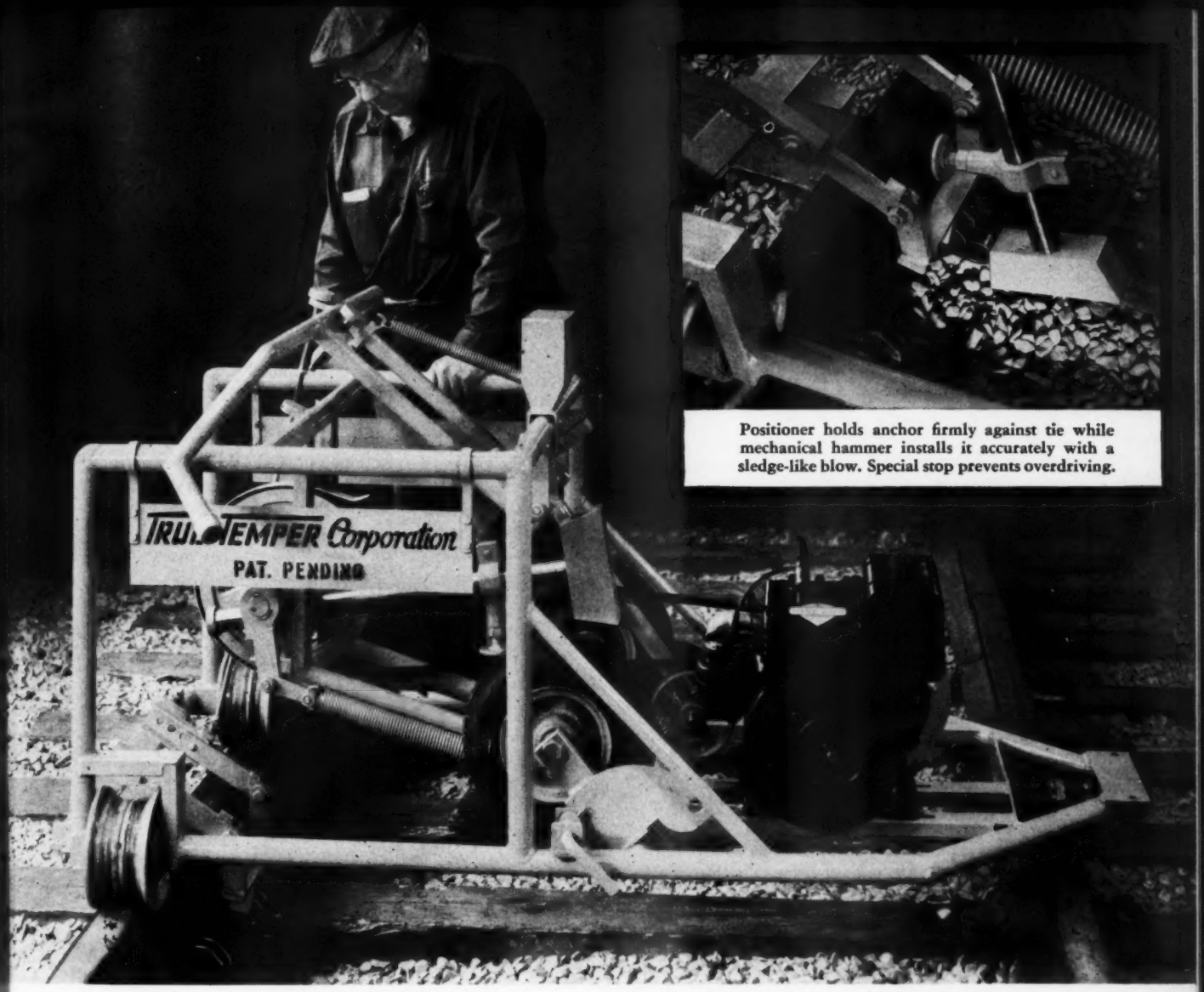
To say there is no need for at least some type of spot-tamping gang is to say that a perfect out-of-face surfacing and tie-renewal cycle has been attained. That is, no spot tamping will be required until it is time for the next surfacing cycle. This is the goal that each railroad employing a cycle maintenance program is striving to reach. But few, if any, roads ever achieve it.

While I feel there is a definite place in any maintenance program for some type of spot-tamping gang to maintain acceptable riding conditions, careful consideration should be given to eliminating the causes where stretches of track habitually require attention. This can be accomplished in many cases by driving piling, grouting, and relaying with new or good secondhand rail. Particular attention should be given to tamping joints tight when the cycle surfacing is being done. If the amount of raise made during out-of-face surfacing is not held to a minimum, it will, besides using more ballast than is actually required, be necessary to follow up with a spot-tamping gang to smooth spots that settle.

A spot-tamping gang, its size, equipment, and length of territory will be governed almost entirely by local conditions. On our railroad, we use small section gangs of two to four men for spot tamping, covering approximately 30 miles. To effectively control and use these gangs requires close supervision and planning by the division engineer and track supervisor. They must decide where and when any extensive spot tamping is necessary and make arrangements for the amount of labor required. Operating under these conditions we have equipped almost every gang with an electric four-unit tamping outfit. Even if a gang is cut to two men, it is still possible to do a small amount of spot tamping, such as at low joints, or even on several rail lengths of rough track.

In establishing gangs such as these, it is necessary to be well informed on all conditions that will affect the amount of work that will be required of each gang. For example, on one of our districts, which is 140 miles long, a 10-year record was kept on spot tamping required between out-of-face surfacing and tie-renewal projects. It indicated that it would be possible for one crew, comprised of a foreman and two men, to perform all spot tamping necessary to maintain good riding conditions over a 50-mile territory, and to do all other small jobs required. However, on another portion of this district, more spot tamping is required because of the condition of the soil forming the subgrade. At present we are in the process of grouting these soft spots to try to eliminate the need for excessive spot tamping.

Spot-tamping gangs are a necessary part of maintaining a good railroad, but, if a program of preventive maintenance is carried out, the number of gangs and the amount of money required to keep the track in good operating condition can be held to a practical minimum.



Positioner holds anchor firmly against tie while mechanical hammer installs it accurately with a sledge-like blow. Special stop prevents overdriving.

Mechanical driver and Bulldog anchors give you

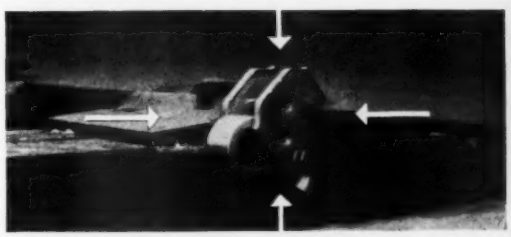
ALL THE HOLDING POWER YOU'RE PAYING FOR

True Temper's new mechanical anchor driver makes sure you get full benefit of the BULLDOG anchor's tremendous holding power.

Essentially a mechanized sledge hammer, the new driver weighs only 425 pounds. It positions each anchor snugly against the tie, then installs it quickly and uniformly to give you all the holding power you're paying for.

Because of its one-man operation, light weight and retractable setoff wheels, the mechanical driver is a fast, flexible, cost-cutting machine. Its speed and simplicity made it a top favorite at the National Railway Appliances Exhibition in Chicago.

Be sure you get the full story on BULLDOG rail anchors and machine application as pioneered by True Temper. Contact your True Temper representative, or write True Temper, Railway Appliances Division, 1623 Euclid Avenue, Cleveland 15, Ohio.



BULLDOG anchor has two-way grip

Two elements in the BULLDOG anchor — a resilient steel spring and a double-jawed clamp of hardened steel — create a positive two-way grip that actually multiplies and sustains holding power. Factory-assembled as one unit, the anchor is easy to ship, handle and install.

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TRUE TEMPER® BULLDOG RAIL ANCHORS

YOU CAN LOOK TO TT FOR LEADERSHIP

What's the answer? (cont'd)

Extends surfacing cycle

By R. J. D. KELLY
Engineer Maintenance of Way
Delaware & Hudson
Albany, N. Y.

No matter how excellent a surfacing job is done by the cycle gangs in connection with tie renewals and out-of-face surfacing, the surfacing does not stay that way indefinitely under present-day freight-train speeds and actual loadings.

In due time, between cycle surfacing, the track gets out of surface at various points due to the inequality of the bearing capacity of the subgrade, drainage difficulties, rail-joint conditions, engine burns, etc., and it is then, of course, that spot tamping is very necessary if a first-class surface is going to be maintained.

As a result of the cycle method of tie renewals and out-of-face surfacing, combined with adequate stone ballasting, ballast cleaning, weed control, rail grinding and full development of the production gang power tamper, the amount and frequency of spot tamping has been considerably reduced in the last few years. However, it has not yet been eliminated by any means.

I believe that spot tamping, in addition to the cycle operations, is very necessary, for with adequate spot tamping properly programmed and carried out it can be a very important element towards extending the period between cycle-surfacing operations.

Hold to a minimum

By T. O. MANION
District Engineer
Missouri Pacific
Kansas City, Mo.

Spot tamping is one of the most costly operations carried out by railroad maintenance men today. Many railroads have equipped their sections with individual power tools for spot tamping. The equipment is used mostly by small section gangs of three to five men, and only for spotting up troublesome joints, crossing frogs, highway crossings, switches, etc. These are jobs of short duration. Some roads still use hand tools for this work.

Spot tamping will remain with us because of these conditions. However, it should be held to a minimum as, in addition to being expensive, it is far from satisfactory.

Equipment available today will raise a minimum of one-half inch on a smoothing surface (tamping each tie) without using additional ballast. With this equipment a gang of 12 men can surface out-of-face an average of 4,000 to 5,000 ft of track per day, provided traffic is not over four to six trains per day. Under the same conditions a spot-tamping gang would do little better and perform a far less satisfactory job.

Normally, where spot tamping is required, it would be extensive enough to perform an out-of-face operation. Thus, the cycle for this work is shortened to take care of the situation in areas where weak spots are prevalent.

Many railroads have lengthened sections and reduced the number of men in each gang to a point where they can perform only minor duties. Special or chore gangs are provided for heavy maintenance. Certainly, a three-man section with 20 miles of track could do very little in the way of spot tamping. This makes it necessary to use special gangs of 12 to 15 men for this work.

On a single-track railroad, where heavy traffic would make it necessary to remove equipment from the track many times per day, hand tools for spot tamping would be an advantage. However, most railroads having these conditions maintain multiple tracks. This permits sections of the main track to be taken out of service for certain periods of the day for allowing the maintenance-of-way machines to work undisturbed.

Restoring floorbeams and stringers

What is the best way to restore badly corroded floorbeams and stringers under traffic in a through-girder or through-truss railway bridge? Describe.

Replace member

By H. BOBER
Bridge & Building Engineer
Gulf, Mobile & Ohio
Mobile, Ala.

Unfortunately, deterioration of steel floorbeams and stringers in railroad bridges is a difficult problem and to my knowledge no entirely satisfactory prevention is in practical use.

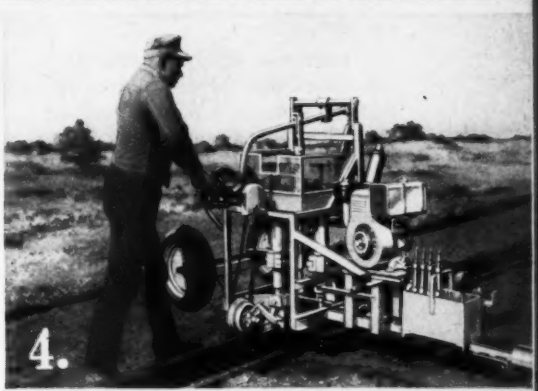
Surfaces of these members are exposed to the most corrosive conditions. In the days of the steam locomotive, inspection frequently showed serious deterioration from cinders and ashes which had fallen from the firebox. This material, combined with rain water, attacked the steel. With the steam locomotive almost a thing of the past, we had hoped corrosion would be greatly lessened. However, the location of these members directly below the track, especially the space between the ties, provides lodging for dirt, sand and trash which absorbs brine drippings from refrigerator cars, and corrosion goes on.

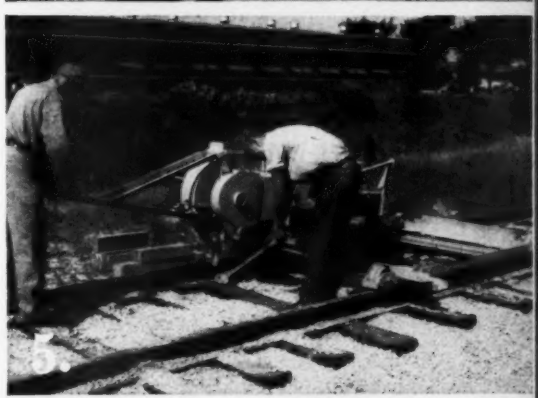
The carrying capacity of an existing steel bridge is based on a higher unit stress than was used in the original design. Most railroads use those prescribed by the AREA (Committee 15, 1951).

When floorbeams and stringers are found to be substantially corroded, our first step is to measure the depreciated section carefully with steel calipers. This reduced section is then rated according to the AREA rating rules. If the rating is still substantially above the rating of the heaviest equipment operating over the bridge, no immediate repairs are required.

The next step is to stop any further corrosion. This can only be done by thorough cleaning and painting. It is often desirable to repeat such work at intervals of not less than two years, or even oftener.

Cut Your Maintenance Costs with these efficient *"Mechanical Muscles"*





1. NORDBERG POWER JACK . . . Raises track hydraulically without disturbing alignment and speeds up tie renewal, ballasting and general surfacing operations. Simple to operate and maintain, the Power Jack is thoroughly proved through years of use.

2. NORDBERG GANDY . . . A machine used to pull out old ties, insert new ties, pile or load old ties, set machines on or off the track, distribute new ties, including hauling them to the work location. A great money saver in bridge timber renewal.

3. NORDBERG HYDRAULIC SPIKE PULLER . . . Simple, positive, portable machine that automatically ejects spikes. Provides flexibility and economy in tie renewal, switch renewal and bridge work—pulls spikes quickly on either rail and can be operated on or off-track.

4. NORDBERG TIE DRILL . . . Fastest Tie Drill on the market . . . drills two holes at once . . . one man can spot and drill 48 holes in just 2½ minutes! Centrifugal clutch provides positive power transmission.

5. NORDBERG SPIKE HAMMER . . . Drives spikes *fast, straight, vertical to the tie and to the correct depth.* Like other widely used Nordberg "Mechanical Muscles", this rugged machine saves time, reduces costs and does a better job than is possible with other methods.

It will pay you to investigate the full line of modern, money-saving Nordberg track maintenance machinery for meeting today's maintenance needs. For further details on any or all of these Nordberg machines, write for literature.

NORDBERG MFG. CO., Milwaukee 1, Wisconsin

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"Mechanical Muscles"

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R658

What's the answer? (cont'd)

If corrosion has progressed too far, repairs are necessary.

There are several methods of repair. The first one mentioned below is the most satisfactory, but also the most expensive.

(1) Replacement of the entire member.
(2) Replacement of part of the member, such as a cover plate or the top flange angles of stringers.
(3) Application of new cover plates or additional cover plates, if original members already have plates.
(4) Application of welded (or riveted) patches at corroded places.

It has been found recently that the application of partial-length cover plates, whether they be welded or riveted, gives unsatisfactory results. Tests have shown that their fatigue strength is disappointing, and, where used in members having a high frequency of stress applications, their expected strength is much lower than anticipated. Any repairs which tend to concentrate stresses locally (such as at the ends of cover plates) cannot be expected to give a very long service life.

Local fillet welding of patches is open to the same objections.

Application of new full-length cover plates is a satisfactory solution if the original angles still have enough section to develop the rivets which will connect them.

Replacement of flange angles which have been severely corroded will restore the bridge to its original strength. It will require the services of an experienced steel-erection crew. Considerable time in changing out these members can be saved if the rivet spacing is known from plans, and checked in the field, so that the angles can be shop-punched correctly and will fit the existing holes in the webs.

As usual for railroad bridge work, no general policy can be laid out, but each case should be decided after a study of conditions.

Use of SH lumber in buildings

To what extent, and for what purposes, is it practicable to use secondhand lumber in railway buildings? What lumber reconditioning is first necessary?

Use new material

By T. W. Toal
Master Carpenter
Chicago, Rock Island & Pacific
Des Moines, Iowa

I believe it involves a matter of economics, and the purchase of new material is nearly always the answer. If a hypothetical case could be set up and a supply of good, cleaned secondhand dimension and sheathing lumber was available, then there is nothing wrong structurally in using secondhand lumber. However, this will happen in only a hypothetical case, as the usual job would require B&B labor to tear down an existing railway building, clean and sort the usable lumber, at wages in the vicinity of $2.23 per hour.

The only type of secondhand timber we regularly use in buildings is creosote blocking, such as caps and pile butts, in the foundations.

Not good practice

By L. P. Drew
Assistant Chief Engineer
Union Pacific
Omaha, Neb.

There are many uses for secondhand lumber in railway maintenance, provided the material can be salvaged for reuse at a cost less than new, preferably about 50 per cent of the cost of new material.

Ordinarily it is not good practice to use secondhand lumber in new construction. An exception is in a few cases where material is not subject to stress or is hidden from view. As an illustration, 1-in lumber used for concrete forms is suitable for roof sheathing and subfloors.

Secondhand lumber for reuse should be carefully inspected to see that it is suitable. Also, all nails, bolts, spikes and other hardware should be removed. No further reconditioning is usually necessary, except for secondhand lumber to be used in ground contact. It should then be pressure treated with a suitable preservative.

Do not stockpile

By W. P. Gibson
System Master Carpenter
Spokane, Portland & Seattle
Portland, Ore.

The use of secondhand material in railway buildings depends largely on circumstances in each individual case. The reuse of some secondhand material is practicable providing its reuse can be accomplished in the same structure or in the same vicinity in the near future.

It does not prove economical to recover secondhand material and store or stockpile it for use on other districts or divisions as the labor cost of reclaiming and rehandling often exceeds value of the life expectancy of the material.

Therefore, it is necessary to figure closely all the added costs of reclaiming and handling in connection with the use of this material to determine economy of its re-use.

Not in other buildings

By E. J. Holmes
Master Carpenter
Erie
Huntington, Ind.

One of the first things to consider in the use of secondhand lumber is the source from which it is obtained. Most buildings being retired are old buildings with partially dressed or rough lumber of full width and thickness. Hence, it is wider and thicker than the standard stock-size lumber of today. This limits its use to jobs where it must be used by itself or on work of a rough nature where it could also be worked in with the present thinner lumber.

The condition of a building or structure must also be considered before deciding to spend the time required to salvage the secondhand lumber. If a large part of a structure is either rotted, split, worn or weath-

Workmen using maintenance platform to remove loose concrete from bridge.

Versatile Austin-Western Hydraulic Crane: valuable off-track on-track workhorse at Reading Co.

The Reading says: "About three years ago we made a time study of crane operation and found that an off-track on-track machine would be of tremendous advantage. With the cooperation of Austin-Western engineers, we developed a crane and rail car combination that has proved very valuable along right-of-ways and in our shops and yards.

"The crane, mounted on a tractor with 4-wheel drive and steer, has a capacity of 5 tons at a 10-ft. radius. Equipment includes outriggers, hydraulic clamshell bucket, 8-ft. dozer blade, magnet, and boom platform. In operation the crane crawls up onto the car, couples to it, and propels itself down the track. It then crawls off the car, picks the car off the track, places the car on a trailer, and tows the entire outfit down the highway.

"As soon as it started to work, the crane proved its value. It was necessary to remove loose concrete from an overhead bridge. The platform was hooked to the telescoping boom and the crane worked from the rails. The workmen were swung from place to place with perfect ease and safety, without having to work under the loose concrete. From one track they were able to swing over alongside the abutments and do a thorough job on them. Without the crane, scaffolding would have had to be erected and then removed for the passage of trains or else the men would have had to work from the top of a boxcar.

"In addition to jobs like this, the crane does dozens of others, including tracklaying, car unloading, ditching, pipelaying, grading and snow removal. We are constantly finding new ways that it can save us time and money."

The A-W crane is also available with retractable guide wheels, making it the most flexible off-track on-track tool in the railroad industry. Ask your nearby A-W representative about these machines . . . or write us direct.

Austin-Western CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

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er beaten, it will in all probability be more economical to tear it apart in sections and dispose of it.

The yield of salvable material from structures that are in good condition, and built with standard stock-size lumber in present-day use, will warrant the expense of dismantling them piece by piece, removing the nails or other type fasteners, and stockpiling or shipping the material to other locations.

The occasions for obtaining secondhand lumber on this division have been few and far between. Secondhand lumber, however, is mostly used for the building of formwork for concrete structures, curbing, bituminous platforms, driveways, shoring for excavations, and similar purposes.

The largest percentage of construction today is of non-combustible material. This limits the use of lumber mostly to formwork, roofs, floors and trim. Therefore, I would not recommend the use of secondhand lumber on new and permanent construction.

Good secondhand timber, in thicknesses of 4 in and up, has many uses. It can be used for falsework in the repair of bridges and buildings, repairs to building and dock substructures, platforms, trestles, bridge decks, timber-constructed shop buildings, and similar facilities.

Is it economical?

By D. A. KUEBLER
Division Engineer
Kansas City Southern
Pittsburg, Kan.

The first question that arises in considering the use of secondhand lumber is the source of the material. We do not consider the purchase of secondhand lumber as we have not found it economical. Our experience has been that we normally do not get enough usable lumber in dismantling a frame structure with company forces to justify the cost. However, in many instances, it is necessary to dismantle or partially dismantle a structure with company forces in connection with remodeling or reconstruction. In salvaging lumber from such operations, it should be cleaned of nails and other hardware and, unless it is to be used on that job, it should be sorted and stored for future use and not left in a pile.

We find in our territory, where pine lumber has been used almost exclusively, much of the lumber in old buildings is of better grade and will still last longer than much of the new lumber now used. This, of course, applies particularly to dimension lumber such as is used in joists, studding, rafters and some sheathing. Such lumber will be as good or better than new lumber for similar uses and for supporting concrete forms, for scaffolding, and numerous other uses. In fact, secondhand lumber, if of proper size and length, will serve as well as new for almost any purpose unless it is to be left exposed to view and where a neat appearance is desired. About the only difference is that a few nails that have been overlooked may be encountered. In some instances, there may be more waste than if a bill of new material is ordered to fit the job.

Therefore, the use of secondhand material will depend almost entirely on whether or not it will pay to recover it. If there is a choice between selling a frame structure or dismantling it with company forces, the decision should be based on whether or not the value of the lumber recovered will equal the cost of dismantling. The cost of dismantling should include cleaning, sorting and storing the lumber released. Usually we have found it more economical to sell such structures for dismantling by others. Another consideration that may have considerable bearing on the decision is that when secondhand lumber is used, it will result in a lesser charge than for new lumber, whether used in A&B work or maintenance.

Long ties at soft spots

Is it practicable to use long crossties in track where a number of soft spots exist? Or should other more-permanent corrective measures be taken? Explain.

Install drainage ditch

By George YAROS
Section Foreman
Baltimore & Ohio
Bradford, Pa.

I don't think it is practicable to use longer crossties where soft spots exist. You'll still have the soft spots and more mud if you don't have good drainage. It is very important to have water draining off instead of standing on the roadbed, which keeps it soft and muddy. Sometimes, where the water cannot easily drain off, a drainage ditch should be constructed off the subgrade, or 10 to 12 ft off the shoulder.

We had a mud hole about 120 ft long in clay. We tried almost everything to correct it, then we put in a drainage ditch. That was a good solution because the spot gives no trouble now.

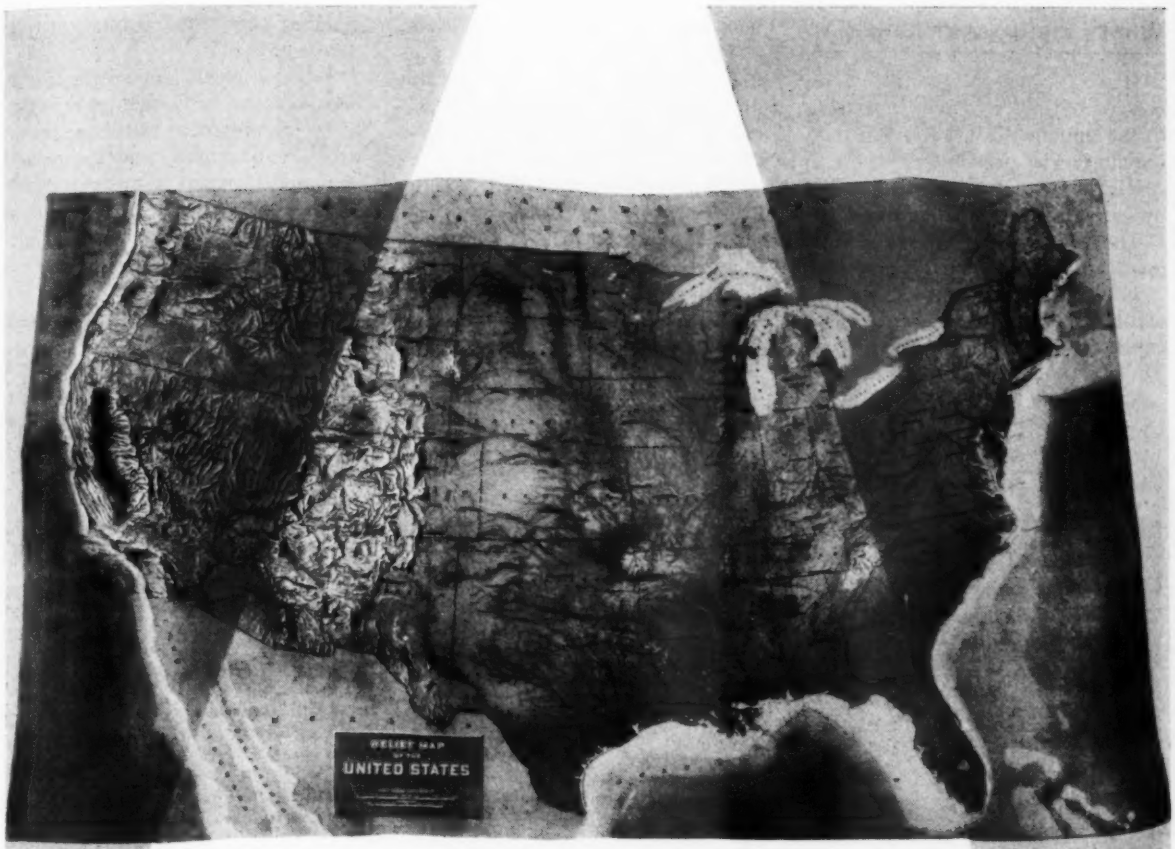
When you have just a bad joint here and there, it would be better to dig down about a foot at the ends of the ties, raise the joint a little high, dig out all the mud, fill it in with clean ballast, and tamp. After the first train goes over it, the joint will be at the proper elevation. A few days later, if the joint looks low, spot it up again. It will stay up better this way than by putting in longer ties.

They spread the load

By E. L. ANDERSON
Chief Engineer (Ret.)
St. Louis-San Francisco
Springfield, Mo.

It is entirely practicable to use extra-length crossties or timbers supporting the rail where soft spots exist. This method is particularly applicable where scattered soft spots occur of short length.

In addition to extra length, the



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What's the answer? (cont'd)

spacing of timbers may be cut down to the minimum allowable for good tamping. The principle of this is to spread the load as widely as possible by increasing the total bearing area.

The economy of this method is predicated on the following precepts:

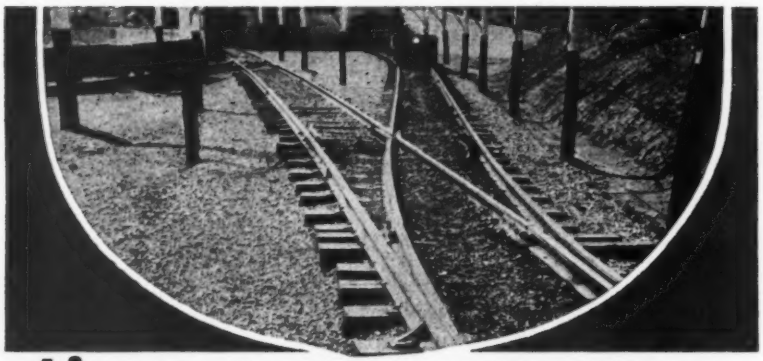
(1) Spots are relatively short and scattered, which would cause heavy expense per foot of track if permanent corrective measures are taken.

(2) Locations are such that regular track forces can insert the ties or timbers, but other than track forces would be required if other corrective measures were taken.

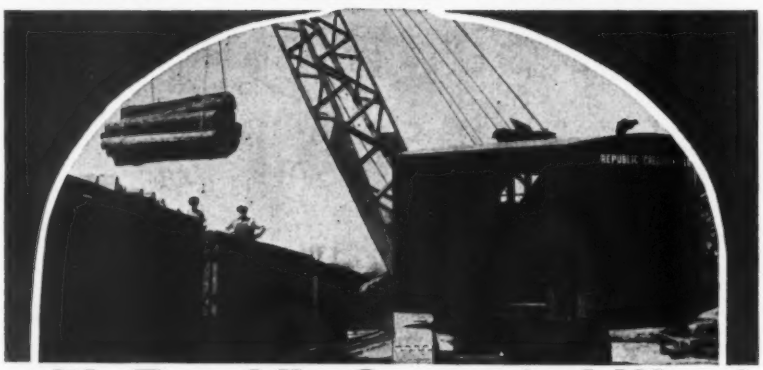
(3) Secondhand switch ties or bridge stringers are available for the job that otherwise would not be used to much advantage.

(4) That unusual conditions exist in the roadbed structure making a very difficult job to stabilize the roadbed by the permanent-type methods.

While I would not advocate this type of action be used entirely in lieu of more permanent corrective measures, it can be used to advantage and economically so in many cases. Spoting can be reduced if judgment is used in selection of locations as outlined above at nominal expense.



time means more...



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Reducing railroad crossing designs

What measures can be taken to reduce the number of designs of railroad crossings? Explain.

Change alinement

By F. W. CREEDLE
Chief Engineer
Railroad Products Division
American Brake Shoe Co.
Chicago, Ill.

The first item for the railroad to consider is re-alining the track so as to eliminate curvature through the crossing (or crossings). When doing so, it should change the alinement to make as many crossings as possible of the same angle. There are many groups of crossings where more than one track crosses others, and much expense (patterns, inventory, etc.) could be eliminated if they were all made to the same angle.

The second consideration is the type of construction, which is directly related to the crossing angle, density, speed and class of traffic which passes over the tracks. In many cases the maintenance expense, and not the original cost, is the deciding consideration.

For heavy tonnage at all speeds, and for moderate to heavy tonnage where the speed is high, best results have been obtained by using manganese-steel-insert or solid manganese-steel crossings in accordance with the appropriate AREA plans. The angles between approximately 20 deg and 35 deg have been very difficult to maintain and the manganese-steel-insert design is particularly recommended for this application. If the alinement is tangent on both runs, particularly if there are two or more

Maintenance Cost Reduction

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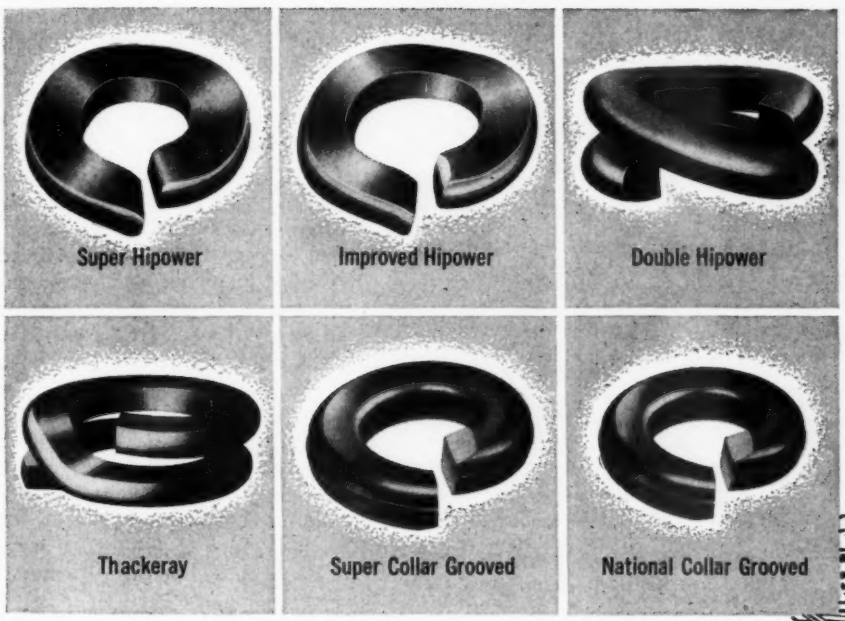

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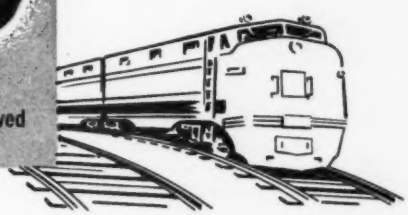

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What's the answer? (cont'd)

crossings involved, a reversible-insert design will permit maintenance of the crossings with the minimum amount of emergency material.

Crossings made of open-hearth rail are used under all conditions but, in general, their use is more popular on tracks carrying light to moderate tonnage, due to lower initial costs.

Sort into groups

By F. L. Horn
Engineer of Track
Terminal R. R. Association of St. Louis
St. Louis, Mo.

I have interpreted the meaning of the question to pertain to the varied crossing angles rather than the basic designs of crossings. The reasoning behind this interpretation is that widespread use of crossings at standard angles can be carried out on each railroad, while industry acceptance of standard designs or angles involves agreement between many railroads—a difficult matter to achieve.

A study of the angles of railroad crossings in service will permit the crossings to be placed in a number of groups. Each group will have angles within a spread of from three to five degrees. Further study of speed, type, and amount of traffic, together with existing alinement on both routes through each crossing in each group, should then be made to determine whether rather minor changes in alinement on one or both routes would permit installation of a crossing with an angle that is near the median angle of the group.

A standard crossing, tangent on both routes, can then be selected for each group for use at locations where realinement can be justified, probably at a majority of crossings within the group. Selection of an existing multiple-track crossing, that cannot be economically re-alined and having an angle near the median of the group, as the standard crpssing for the group will extend the benefits of standardization.

There will be a number of crossings in congested areas, or where high-speed traffic moves over both routes, which cannot economically be re-alined to the selected standard crossing angles. However, careful

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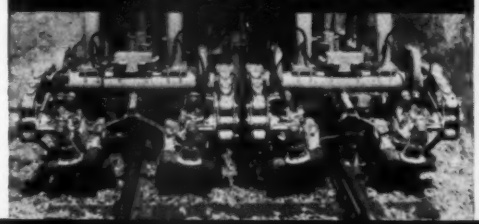

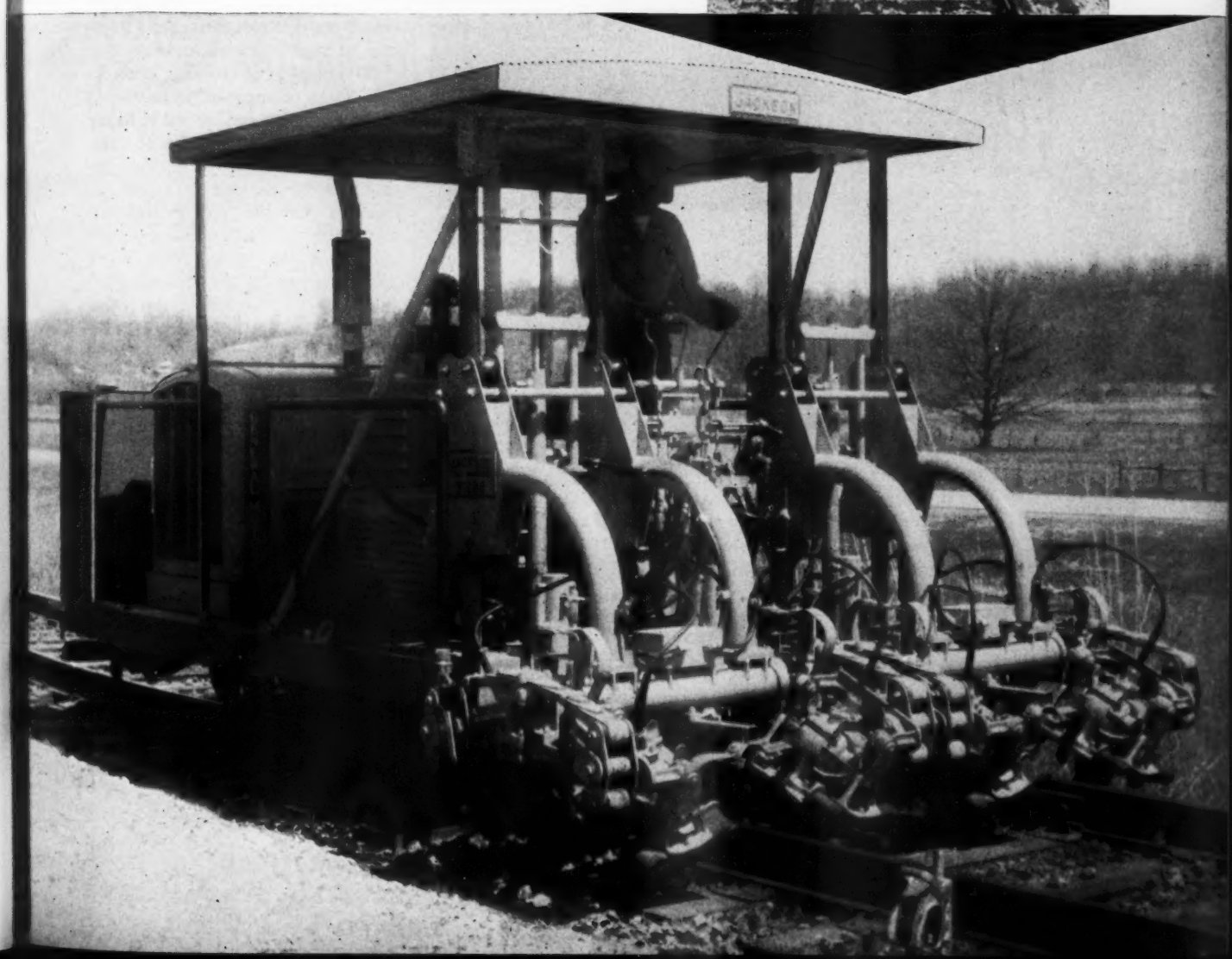

study of each such crossing may often show that minor adjustments in alinement will permit curvature in the crossing to be eliminated, or adjacent multiple crossings to be identical in design. Consideration should also be given to adjustment of alinement at low-angle crossings to permit use of standard turnout frogs as end crossing frogs.

Alinement changes near crossings can usually be made at least cost if carried out in connection with a change in rail section. This is especially true in congested territory. It is, therefore, advisable to carefully consider revision of the angles and alinement through crossings affected by a change in rail section.

Benefits from standardization of crossings accrue primarily from reduced pattern costs for castings and reduced machining costs for rail, plates and other components. Standardization may also permit crossings to be kept in stock, avoiding long lead times normally necessary in crossing manufacture. Elimination of curvature and identical design of adjacent crossings will also reduce pattern and machining costs. Savings realized may easily amount to $1,000 each time a crossing is replaced.

Follow AREA plans

By Troy West
Engineer of Track
Union Railroad
East Pittsburgh, Pa.

The problem of reducing the number of designs of railroad crossings may be resolved by reviewing objectively the various designs now being used and that are recommended by the American Railway Engineering Association. The four general designs of crossings recommended by the AREA, in my opinion, provide a sufficient range in choice from which the railroads can make a selection to meet their requirements.

The bolted-rail crossing, of three-rail design in angles of from 90 deg to 30 deg, is offered for use in heavy traffic with normal speeds. This design has been improved in many details and by the use of better rail sections that are now being produced. A bolted-rail crossing of two-rail design, for angles of from 30 deg to 8 deg, can be satisfactorily used on secondary tracks with less initial cost.

The manganese-steel-insert crossing for angles below 45 deg to 8 deg, and the solid manganese-steel crossing for angles from 90 deg to 25 deg offer materials of slow-failing qualities at higher cost. Such type of crossing is usually considered for use under very heavy traffic at high speeds. The movable-point crossings are recommended for use when the intersection angle is below 14 deg. All of these crossings are being used by railroads over the country because the value of the design has been proven.

An investigation of the service performances of the various AREA-type crossings, as conducted under the general direction of the Engineering Division of the AAR, have shown up weaknesses in these de-

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What's the answer? (cont'd)

signs that have been corrected from time to time. Through the continuous study of plans for switches, frogs, and crossings by AREA Committee 5, collaborating with the suppliers, the best design of crossings, in my opinion, is offered. Also, important details in the design of fillers, flares, point and flangeway dimensions, beveling, through bolts, guards, finish and workmanship are resolved, often by compromise between the railroads' desire and limitations in manufacturing. To promote standardization, and to reduce the number of designs of turnouts and crossings, an AREA committee is presenting facts on the economies to be gained by the railroads from the more extensive use of AREA trackwork plans.

Having thereby thoroughly approached the problem of providing proper crossing design and construction to cover usual conditions, it seems to me that the possibility of reducing the number of designs will depend on individual railroad's acceptance and use of this service. This could be promoted further by the use, when possible, of straight-rail rather than curved-rail intersections, and by avoiding unnecessary small-angle crossings. On each order for a crossing a note should be inserted by purchaser that "the crossing should be furnished in accordance with the latest AREA design." When this is done by the railroads, I believe the necessary measures will have been taken to reduce the number of designs of railroad crossings, and that economies will thereby be derived.

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Association News

Railway Tie Association

The 1958 convention will be held at the Hotel Peabody, Memphis, Tenn., October 29-31. Details of the program are now being worked out. It is possible, however, to announce that the principal speaker will be Russell L. Dearmont, president of the Missouri Pacific. He will be the speaker and guest of honor at the association's annual luncheon, which is scheduled to be held on the second day of the convention.

Biographical briefs

(*Continued from page* 10)

tenance of way department, advancing through various positions until 1935 when he was transferred to the engineering department. In December 1943 he returned to the maintenance of way department as assistant division engineer, being promoted to division engineer in September 1947. In January 1953, he was advanced to engineer maintenance of way of the Eastern Region. In July 1954, Mr. Riley became chief engineer maintenance of the system, the position he was holding at the time of his recent promotion to chief engineer in charge of both the maintenance and engineering departments.

Malcom E. Condon, 50, who was recently appointed district office engineer on the Erie at Jersey City, N. J., (*RT&S*, Mar., p. 10), attended Syracuse University and entered railroad service with the Erie in June 1931 as a trackman at El-

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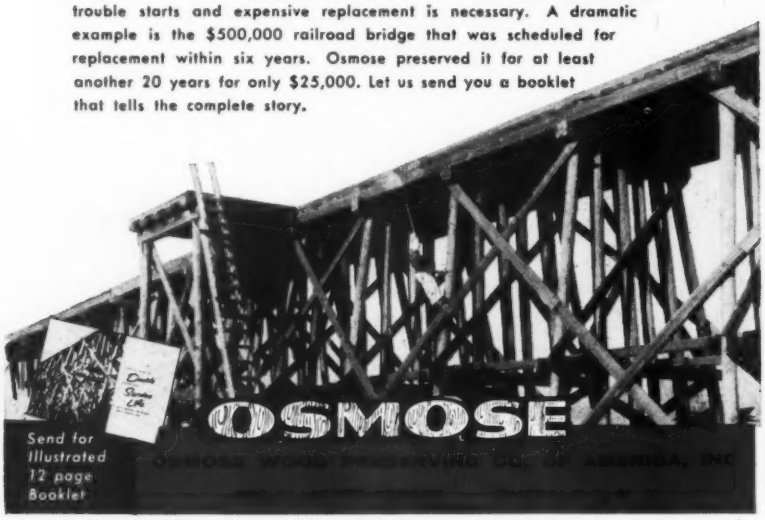

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Biographical briefs (cont'd)

mira, N. Y. He served in various capacities on the engineering corps at Hornell, N. Y., and Jersey City, from 1933 to 1943. In that year he was named assistant track supervisor at Jersey City. From 1945 to 1948 he served as track supervisor at Campbell Hall, N. Y., Dunmore, Pa., Marion, Ohio, and North Newark, N. J. In 1948 he returned to the position of assistant track supervisor and in 1950 was named construction supervisor of the Eastern District. In 1952 he was appointed assistant track supervisor at Jersey City, N. J. In the following year he was named assistant division engineer on the New York division. In 1957 he returned to Jersey City as assistant track supervisor—the position he held at the time of his recent promotion.

Ray O. Nutt, 34, who was recently promoted to district engineer on the Gulf, Colorado & Santa Fe at Galveston, Tex., (*RT&S,* May, p. 10), graduated from Rice Institute with a B. S. degree in civil engineering and entered railroad service with the GC&SF in the chief engineer's office at Galveston in June 1947. He has served continously with the road, except for a period in 1949 when he spent eight months with the Mullen Construction Company at Seattle, Wash. He was appointed division engineer of the Gulf division at Galveston in January 1956, the position he held at the time of his recent promotion.

Charles W. Morrison, 31, who was recently promoted to heavy maintenance and equipment engineer on the Bessemer & Lake Erie at Greenville, Pa. (*RT&S,* May, p. 10), graduated from Ohio State University in December 1948 and started railroading in January 1949 with the B&LE as assistant supervisor track. In February 1953 he was promoted to supervisor track at Greenville, Pa., the position he held at the time of his recent promotion.

Sidney E. Hawkins, who has been appointed track supervisor on the Southern at Valdosta, Ga. (*RT&S,* June, p. 10), was born at Asheville, N. C. He entered the service of the Southern as a section laborer at John Sevier, Tenn., being promoted to rodman at Asheville in July 1951. After serving in various capacities at Asheville and Atlanta, Ga., he was appointed a student apprentice at Knoxville, Tenn., in November 1956. From January 1957 until his recent promotion to track supervisor, he served as assistant supervisor at Asheville.

J. L. McBride, who has been appointed division engineer on the Seaboard Air Line at Jacksonville, Fla. (announced elsewhere in this issue), graduated from the Citadel, with a Bachelor of Science Degree in civil engineering. He entered the service of the Seaboard in 1939, and was stationed almost continuously at Savannah, Ga., until the first of this year when he was promoted to principal assistant engineer at Norfolk. He was holding that position at the time of his recent promotion.

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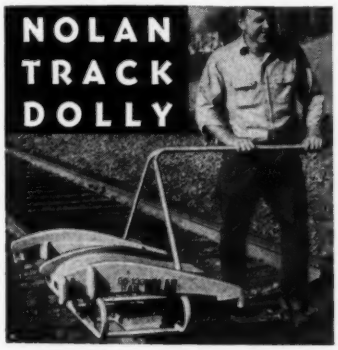

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Built of tubular high-carbon steel. Extremely strong and serviceable. Operator's handle conveniently placed to assure correct balance and full control of heavy loads. Ball bearing cast steel wheels. Convenient spike securely holds dolly in loading position. Deck is heavy mesh expanded steel.

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Length	Width	Ht. Above Rail	Weight	Length	Width	Ht. Above Rail	Weight
50½ in.	15½ in.	6⅝ in.	88 lbs.	36 in.	14 in.	6 in.	60 lbs.

NOLAN

NOLAN TOOL AND SUPPLY CAR

2000 lbs. capacity. All-tubular high-carbon steel construction for safe carrying of ties, rails, supplies, etc. Car breaks conveniently in center into two sections for easy handling and transportation. Deck is heavy mesh expanded steel.

Platform size 48" x 45" Ht. above rail 8"
Weight 140 lbs. complete.

Write for complete railway supply catalog.

THE NOLAN COMPANY
166 PENNSYLVANIA ST.,
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NO ELBOW ROOM?

USE Lewis sealtite slotted head bolts

All products are manufactured in the U.S.A. to A.S.T.M. specifications.

Cross section of head, from above, showing slot, bevel, shank. Bolt available with Loktite No. 2 (shown) or std. sq. and hexagon nuts. Call, wire or write for samples, prices.

Whenever limited space makes wrench work difficult rely on Lewis slotted head bolts. This slotted bolt can be set with a screw driver . . . even in the most inaccessible places. The "wood engineered" bevel under the head compresses and packs the wood, forming a waterproof seal. Available in Hot-Dip Galvanized finish for double-life, greater economy — in black for low first cost.

Lewis BOLT & NUT COMPANY
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MINNEAPOLIS 14, MINNESOTA

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Onan
ELECTRIC PLANTS
ELECTRIC PLANT
NEWS

3,000 watts

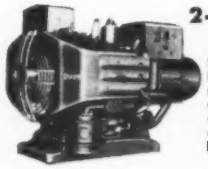
New Onan all-purpose Diesel Electric Plant cuts costs in half!

Lower fuel cost, less maintenance, longer life, cut power generation costs with the Onan 3DSL to half that of small gasoline-powered electric plants! For applications requiring an almost continuous supply of electric power, this new unit gives you unmatched economy and *season after season* of service.

Lighter weight and compact

The new 3DSL is powered by an Onan single-cylinder, air-cooled full-Diesel engine. Available in all standard A.C. voltages and as a 32-volt battery charger. Vacu-Flo cooling, permitting enclosed installations, is standard. The 3DSL has a new mounted muffler, more efficient dry-type air filter, new geared crank, and it's hooded for protection on the job. Smoother running, lighter weight, and compact.

New lower price makes it an even bigger value . . . allows you to "go Diesel" for more power generation needs.



2-cylinder, 5KW ONAN DIESEL

SERIES 5DRP. Air-cooled horizontally-opposed, smooth-running full Diesel engine. All standard voltages available. A higher capacity unit for continuous, low-cost operation.

Onan A.C. gasoline-powered plants: Air-cooled—500 to 10,000 watts. Water-cooled—10 to 150 KW.

See your Onan distributor or write for information

D. W. ONAN & SONS INC.

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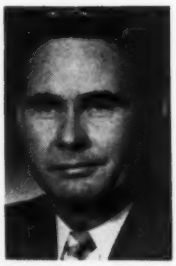
Biographical briefs (cont'd)

George R. Collier
GC&SF


J. D. Morris
Allis-Chalmers

George R. Collier, 52, who was recently promoted to chief engineer of the Gulf, Colorado & Santa Fe at Galveston, Tex., (*RT&S,* May, p. 10) entered railroad service in December 1926 with the Santa Fe as a chainman at Amarillo, Tex. Later he was named transitman on the Slaton Division. In 1930, he returned to Kansas State College to obtain his engineering degree which he received in 1933. In April 1936 he returned to the GC&SF as a rodman at Clovis, N. M., later serving as rodman, building inspector and track inspector on construction of a new line between Boise City, Okla., and Los Animas, Colo. In March 1941 he was called to active duty as captain in the Anti-Aircraft Artillery, and when he left the service it was with the rank of major in the Artillery Corps. Returning to the field engineering forces of the GC&SF at Amarillo, he served successively as building inspector, transitman, and assistant roadmaster, being appointed roadmaster at San Angelo, Tex., in November 1946. He was promoted to general bridge and building foreman at Dodge City, Kan., in May 1948. In October 1951, Mr. Collier was promoted to division engineer at Temple, Tex., and in June 1955 was named district engineer at Galveston, Tex.—the position he held at the time of his recent promotion.

Supply Trade News

ALLIS-CHALMERS—This company has announced expansion of its utility tractor business with the appointment of **J. D. Morris** as sales manager of the new Utility Tractor and Equipment Sales department. He will have offices at the company's headquarters at Milwaukee.

AMERICAN BRAKE SHOE — Raymond A. Martinson has been appointed works manager for the plants of the Ramapo department of this company's Railroad Products division. He will have headquarters in the company's offices in New York.

ARMCO DRAINAGE & METAL PRODUCTS—This company has established a new financing plan for purchasers of its line of prefabricated steel buildings, according to an announcement by **W. O. Robertson,** vice-president. Called the Armco Steel Building Budget Payment Plan, the new set-up includes life insurance protection at no added cost and down payments which range from 20 per cent to 33 1/3 per cent. There is no limit on the amount available under the plan, according to the announcement, and it can provide as much as 200 per cent of the cost of the basic building when it is to be used for industrial or commercial purposes. Financing can be arranged through Armco dealers, or through the company itself. Payments may be made on a variety of schedules with a maximum time limit of five years. The plan was developed in cooperation with Commercial Credit Corporation, and the time sales financing of buildings sold under the plan will be handled under that organization.

D. W. HALLBERG CO.—This company, which represents the **Kershaw Manufacturing Company,** the **National Lock Washer Company,** and the **Power Parts Company,** has recently expanded its facilities. The new office is located at 1026 Federal Building, 24 Palmer Street, Newark 2, N. J.

KOEHRING—The George M. Philpott Co., Inc., 1060 Bryant Street, San Francisco, Cal., has been appointed a distributor for sales and service of the full line of products made by the Koehring Division of this company.

RAIL AND TRACK EQUIPMENT

You can get everything you need for industrial track and crane runways —with one call to your nearest Foster office. Immediate deliveries from the nation's largest warehouser of rails (both new and relaying), switch material, and track accessories. Send for free catalogs and ordering guides.

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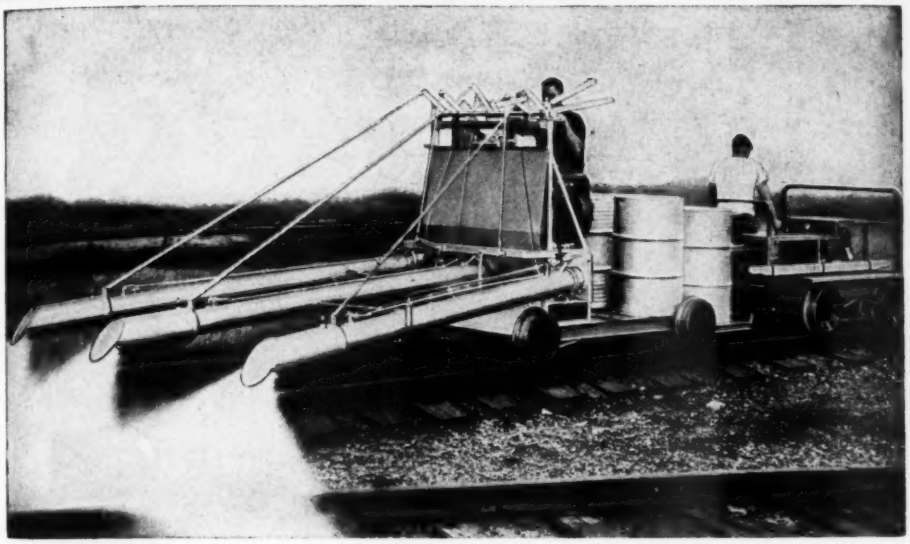
CUT WEED CONTROL COSTS WITH A . . . WOOLERY



A great many millions of dollars have been spent keeping roadbeds clear of weeds—and also for keeping retarders and switches open in the winter.

The Woolery PB-B—a versatile, flexible yard or on-the-line weed burner does these jobs WITHOUT FUSS—AND HAS BEEN DOING THEM FOR YEARS! A good example of what we mean: it destroys all weeds COMPLETELY (due to individually controlled burner arms for raising and lowering as required by ground contour) in a 15-foot swath on one trip and—with burner arms extended on return trip—burns a 25-foot swath! YET THE PB-B CAN BE TAKEN OFF TRACK BY ONLY TWO MEN!

Small, light, inexpensive—towed by a motor car, the PB-B is the ideal burner for yard work—and in many cases BETTER than larger burners for on-the-line work. Can be put on the job FASTER! (Three other Woolery burners in larger sizes available.)

Send for folder #170

Model PB-B
WOOLERY WEED BURNER trailer type (shown above) can be towed by motor car. Three burners clear a swath 15 feet wide on first trip and if required can be widened to 25 feet with burners extended on second trip.

WOOLERY MACHINE CO.

2919 Como Ave. S. E., Minneapolis 14, Minn.

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Q and C Compromise Joints are made of alloy electric cast steel or of rolled and forged steel, heat treated to resist the impacts of heavy service.

They are designed with special reinforcement at the center where additional strength is most needed.

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AerVoiDs provide . . . Sanitary Vacuum Insulation - A positive Health Safeguard!

To-day's "Modern" trend toward centralization of food preparation is a milestone toward Economy, Better Quality and Higher Sanitary Standards.

Into this new picture nothing fits like AerVoiD's Portable, Stainless-Steel, High-Vacuum Insulated, food, soup and liquid Carrier-Dispensers. AerVoiDs alone provide the proven quality and durability to survive under rough usage, spreading their cost over a long period of uninterrupted service.

All AerVoiD Equipment, so indicated in our specifications is "In Compliance" with the sanitary construction requirements of the U. S. Public Health Service Ordinances and Codes.

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19 South Hoyne Avenue, Chicago 12, Illinois

AERVOID Vacuum Insulated Hot or Cold Food, Soup, Milk, Coffee and Beverage Carrier-Dispensers

Wisconsin-Powered Tie Renewal Machine Cuts Costs in Half

CHICAGO HEIGHTS, ILL., New Wisconsin-powered Matisa Tie Renewal Machine rolls old ties out and new ones in at less than half the cost of old-style methods. Hardened steel rollers, two on each side, grip the tie. As rollers revolve, tie is pushed under rails or pulled out. The V-type 4-cylinder Wisconsin Heavy-Duty Air-Cooled Engine also powers pump operating hydraulic power transmission system, moving machine from tie to tie, lifting tie-renewal head and opening and closing tie gripping rollers.

Here's proof of user endorsement of Wisconsin Engines on one unit. Other Wisconsin-powered equipment working on railway maintenance include weed mowers, weed spray cars, oil sprayers, oil spray cars, rail lifters, tie sprayers, tie bed scarifiers, multiple tampers. Users know operator-hours become workhours when Wisconsin-powered equipment goes to work. Wisconsin Engines offer heavy-duty stamina and basic high torque design for load-holding power. *All models can be supplied with electric starting.* Write for bulletin S-223, describing all Wisconsin Engines, 3 to 56 hp.

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powered equipment

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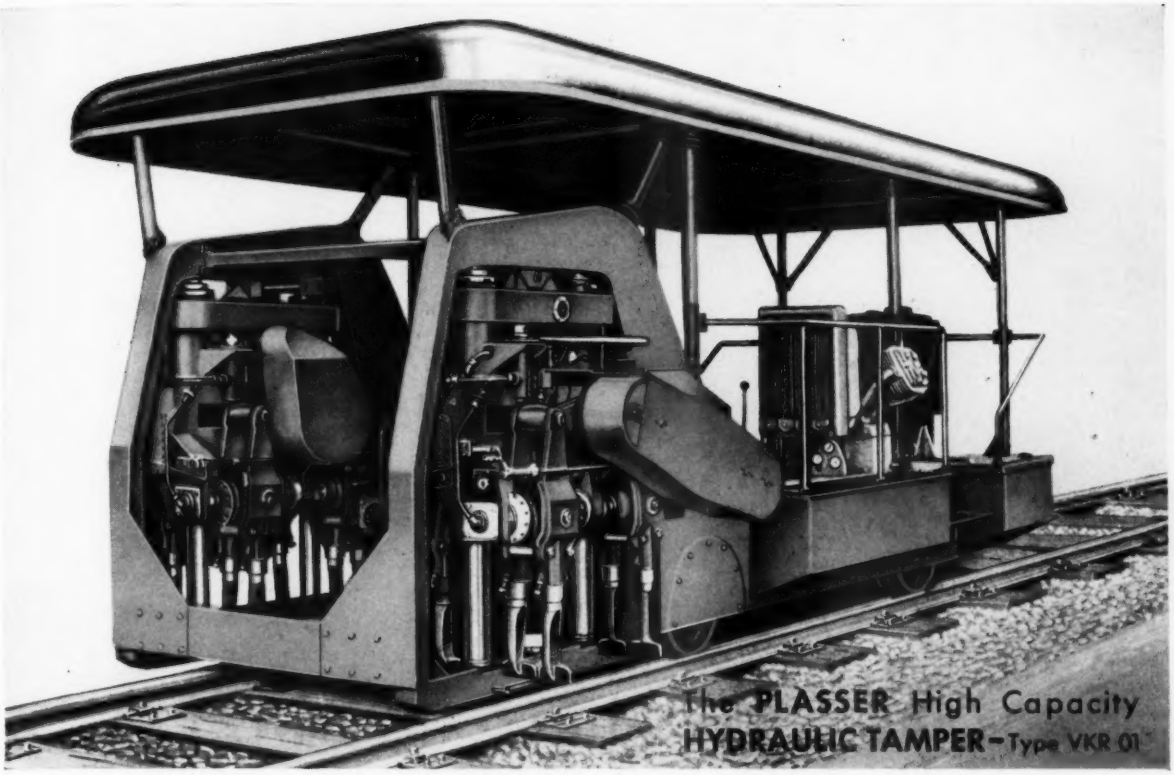

HOW ONE MAN CAN TAMP 1100 FEET IN ONE HOUR!

One chief engineer writes this: ". . . Three of the Plasser machines have worked generally in granite ballast and have had a maximum production rate ranging from 900 ft. to 1,100 ft. per hour, with the maximum surfaced in one day of 6,240 ft. . . . Since we are primarily a single track line, our production is largely dependant on the on-track time we have available . . ."

8 ADVANTAGES

1. Economical one-man-operation.
2. Hydraulic pneumatic controls eliminate manual effort.
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4. Automatically increase tamping pressure at joints and high rails at curves.
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6. Rubber-cushioned axle suspension minimizes vibration.
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PLASSER RAILWAY MACHINERY

RELOCATING 19.5 MILES FOR THE NORTHERN PACIFIC

"We're on schedule because of the ability of CAT-built equipment to work under rough conditions

The quote is from Hugh G. King, President of Bud King Construction Co., Missoula, Mont. The company is moving 1½ million cubic yards to relocate 19.5 miles of Northern Pacific line because of construction of the Noxon Rapids Hydroelectric Project in Montana. The job is big and tough. But a fleet of 24 powerful Cat-built machines is keeping it on schedule.

When the job began, reports Mr. King, the D9 and nine D8s on the job "were half under mud." Excavation includes everything from clay to rock. The King contract calls for completing grading, clearing and excavation of all cuts in clay to a 4-to-1 slope. Width of the roadbed is 30 feet in backwater sections, 25 feet in fills and 44 feet in cuts.

The sure-footed Caterpillar track-type machines are everywhere on the job. The D9—king of the crawlers—is pushloading and bulldozing clay from the slopes. One D8 is assigned to finishing cuts of clay. Another is backfilling 3000 cubic yards of gravel per shift on a site too soft to make grade. Two other D8s are bulldozing clay near the grade to change the land contour for proper drainage.

It takes dependable, all-around equipment like the D9 and D8 to do all these vital jobs and keep the work on schedule. Your Caterpillar Dealer has a complete line of crawlers, ranging all the way up to the mighty 320 HP (flywheel) D9. They have been designed to save you maintenance costs just as the Caterpillar Dealer will save you capital investment by stocking a complete inventory of parts. Call him today for a demonstration on your job. Just tell him when you want the equipment there.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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